

Service  
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**Service**



# Service Manual



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**CLASS 1  
LASER PRODUCT**



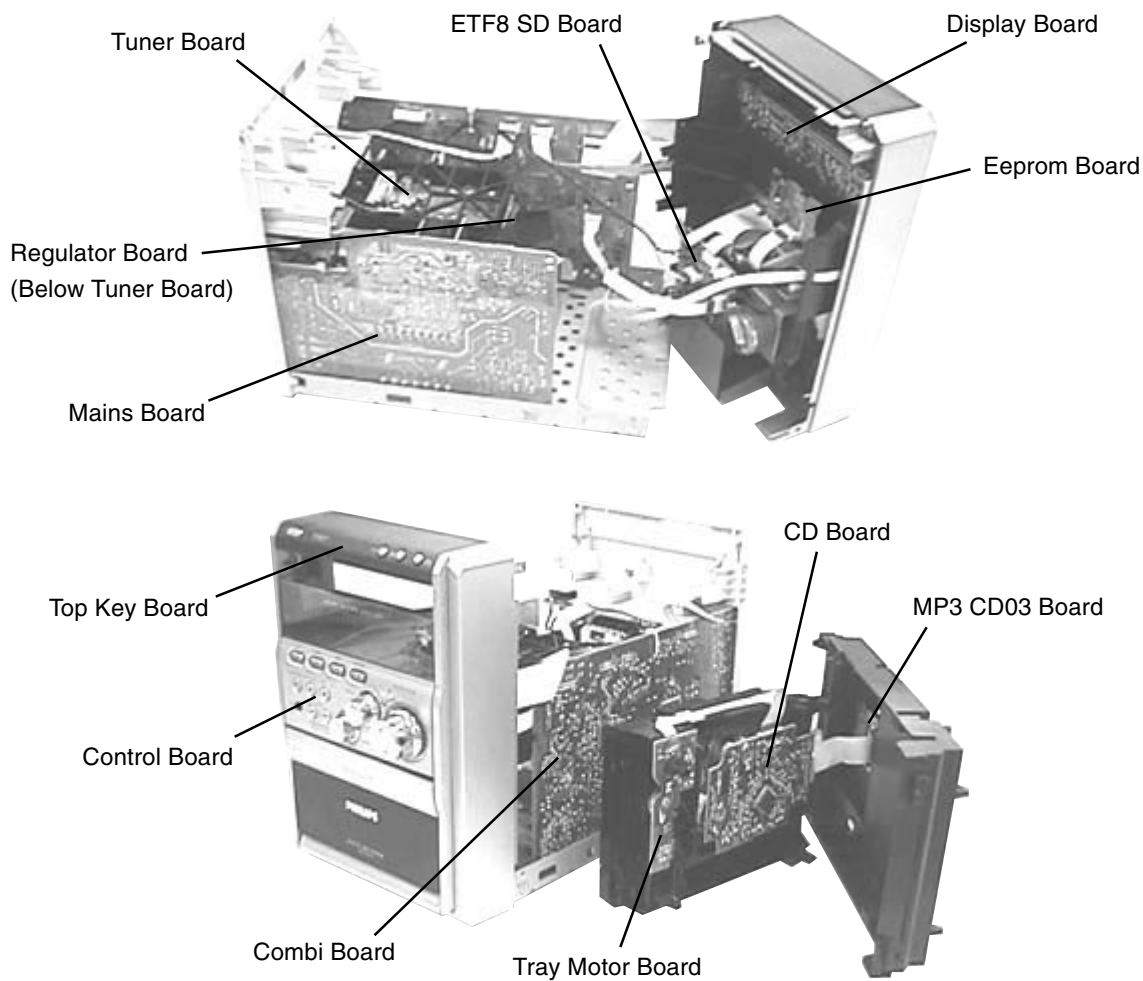
3139 785 30610

Version 1.0



# PHILIPS

## LOCATION OF PC BOARDS



VERSION VARIATIONS:

[illegible]

**SPECIFICATIONS****GENERAL:**

Mains voltage : 110-127V/220-240V Switchable for /21/21M  
 120V for /37  
 220V for /33  
 220-230V for /22  
 230-240V for /30

Mains frequency : 50/60Hz

Power consumption : 80W at  $\frac{1}{8} P_{\text{rated}}$   
 < 15W at Standby (Demo mode off)  
 < 0.5W at ECO Standby

Clock accuracy : < 4 seconds per day

Dimension centre unit : 175 x 252 x 350mm

**TUNER:****FM**

Tuning range : 87.5-108MHz

Grid : 50kHz  
 100kHz for /37

IF frequency : 10.7MHz  $\pm$  25kHz

Aerial input : 75 ohm coaxial  
 300 ohm click fit for /37

Sensitivity at 26dB S/N : < 7uV

Selectivity at 600kHz bandwidth : > 25dB

Image rejection : > 25dB [> 75dB]

Distortion at RF=1mV, dev. 75kHz : < 3%

-3dB Limiting point : < 8uV

Crosstalk at RF=1mV, dev. 40kHz : > 18dB

**MW**

Tuning range : 531-1602kHz  
 530-1700kHz for /21/21M/37

Grid : 9kHz  
 10kHz for /21/21M/37

IF frequency : 450kHz  $\pm$  1kHz

Aerial input : Frame aerial

Sensitivity at 26dB S/N : < 4.4mV/M

Selectivity at 18kHz bandwidth : > 18dB

IF rejection : > 45dB

Image rejection : > 28dB

Distortion at RF=50mV, M=80% : < 5%

**AMPLIFIER:**

Output power (6 ohm, 1kHz, 10% THD)  
 L & R : 2 x 50W RMS

Output power (6 ohm, 60Hz-12.5kHz, 10% THD)  
 L & R : 2 x 45W FTC /37

Frequency response within -3dB : 50Hz-16kHz

Bass : 60Hz  $\pm$  3 Steps

Treble : 12kHz  $\pm$  3 Steps

Incredible Surround : On / Off

**Input sensitivity**

Aux in (at 1kHz) : 500mV at 600 ohm  
 CDR in (at 1kHz) : 1000mV at 600 ohm

**Output sensitivity**

Headphone output at 32 ohm : 15mW  $\pm$  2dB (Max. vol.)  
 CD Headphone output at 32 ohm : 5mW  $\pm$  2dB (Max. vol.)

**CASSETTE RECORDER:**

Number of track : 2 tracks (stereo)

Tape speed : 4.76 cm/sec  $\pm$  2%

Wow and flutter : < 0.4% DIN

Fast-wind/Rewind time C60 : 130 sec

Bias system : 78kHz  $\pm$  10kHz

Rec/Pb frequency response within 8dB : 80Hz - 10kHz

Signal to Noise Ratio (Type I) : > 48dBA

Signal to Noise Ratio (Type II) : > 52dBA

**COMPACT DISC:**

Measurement done directly at the connector on the board.

Output Resistance : < 100 ohm

Output Voltage (0dB, 1kHz) : 0.5Vrms  $\pm$  1dB (unloaded)

Channel Unbalance : <  $\pm$ 1dB

Channel Separation (1kHz) : > 60dB

Frequency Response ( $\pm$ 3dB) : 20Hz-20kHz

Signal to Noise Ratio : > 76dBA

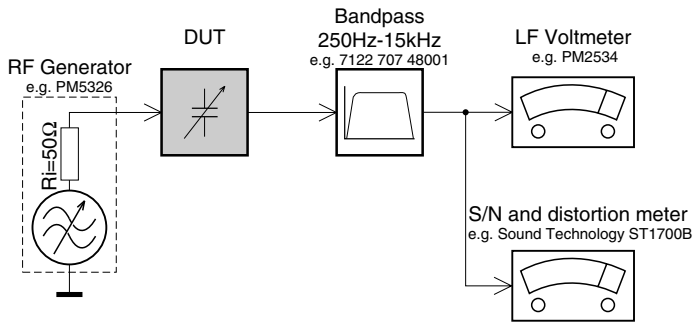
MP3-CD Bit Rate : 32-256 kbps

Sampling Frequencies : 32, 44.1, 48 kHz

[....] Values indicated are for "ECO6 Cenelec Board" only.

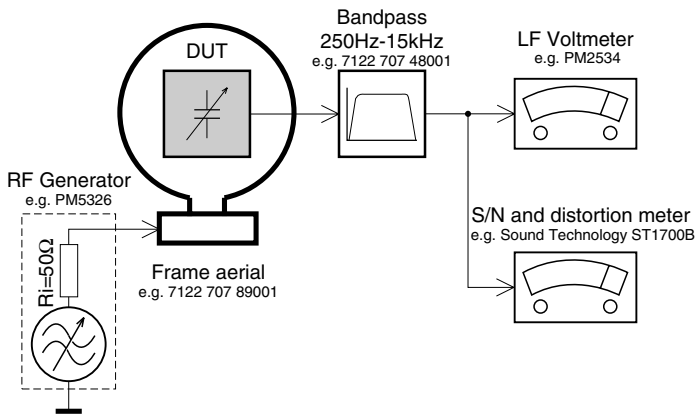
## MEASUREMENT SETUP

### Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilotone (19kHz, 38kHz).

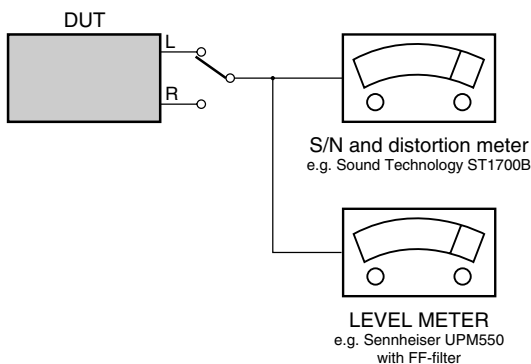
### Tuner AM (MW, LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.  
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

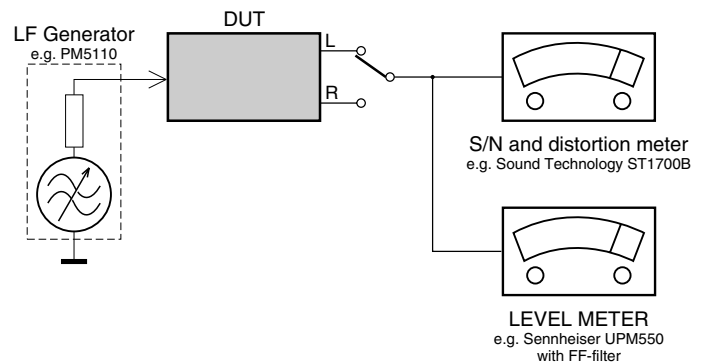
### CD

Use Audio Signal Disc SBC429 4822 397 30184  
(replaces test disc 3)



### Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069  
or Universal Test Cassette **Fe** SBC420 4822 397 30071





## SERVICE AIDS

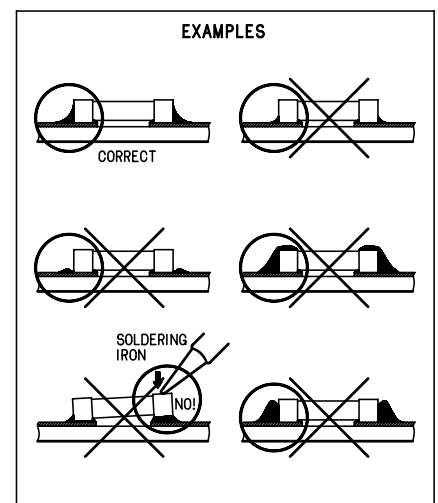
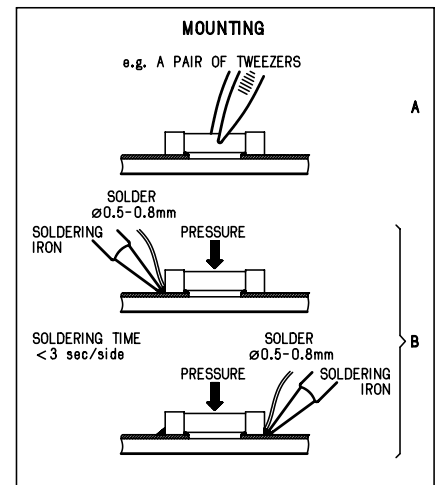
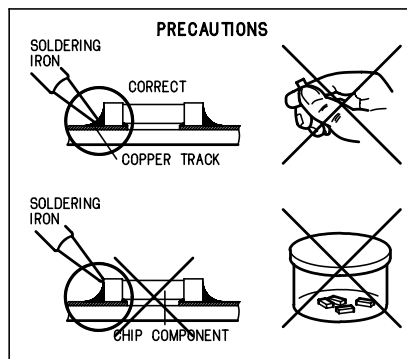
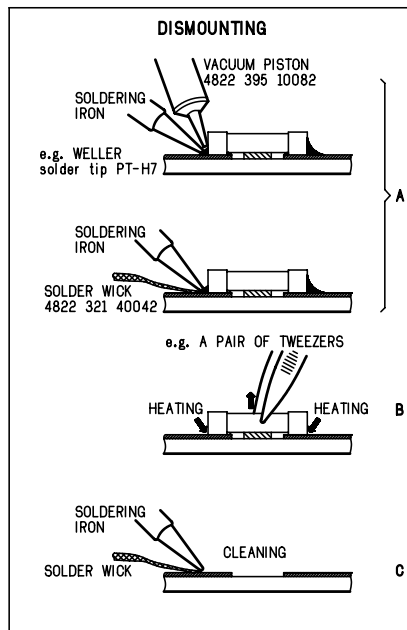
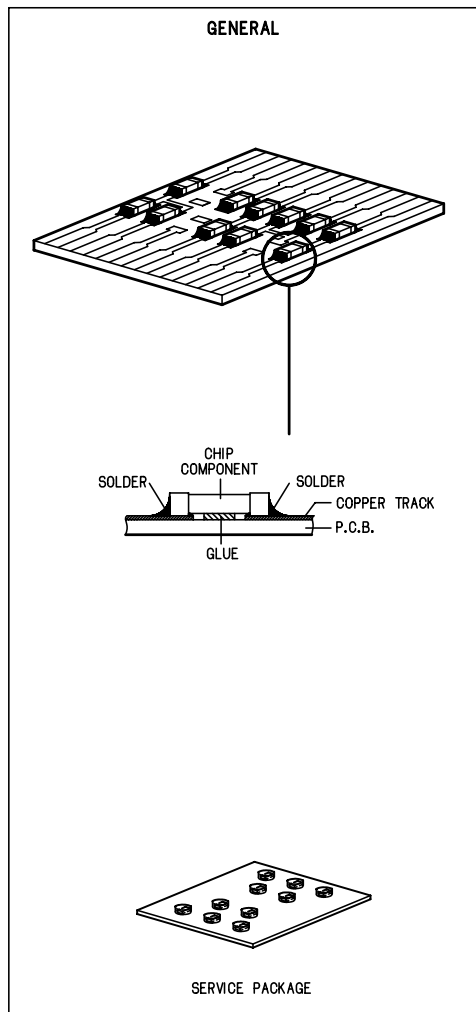
### Service Tools:

Universal Torx driver holder .....	4822 395 91019
Torx bit T10 150mm .....	4822 395 50456
Torx driver set T6 - T20 .....	4822 395 50145
Torx driver T10 extended .....	4822 395 50423

### Compact Disc:

SBC426/426A Test disc 5 + 5A .....	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz .....	4822 397 30155
SBC429 Audio Signals disc .....	4822 397 30184
Dolby Pro-logic Test Disc .....	4822 395 10216

## HANDLING CHIP COMPONENTS



**GB WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.

When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

**ESD****NL WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD). Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.

Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.

Houd componenten en hulpmiddelen ook op hetzelfde potentiaal.

**F ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).

Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.

Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**D WARNUNG**

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).

Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.

Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.

Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

**I AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).

La loro longevità potrebbe essere fortemente ridotta in caso di non osservazione della più grande cauzione alla loro manipolazione.

Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.


Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**GB ESD PROTECTION EQUIPMENT:**

Complete Kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) ..... 4822 310 10671  
Wristband tester ..... 4822 344 13999


**GB**

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used

Safety components are marked by the symbol .


**NL**

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

De Veiligheidsonderdelen zijn aangeduid met het symbool .

**F**

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisés les pièces de rechange identiques à celles spécifiées.

Les composants de sécurité sont marqués .


**D**

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

Sicherheitsbauteile sind durch das Symbol  markiert.

**I**

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

Componenti di sicurezza sono marcati con .

**GB**

After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA.

**GB Warning !**

Invisible laser radiation when open.  
Avoid direct exposure to beam.

**S Varning !**

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

**SF Varoitut !**

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

**DK Advarse !**

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

**F**

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

## DISMANTLING INSTRUCTIONS

### *Dismantling of the Cover Cassette and Universal Loader*

- 1) Remove the Cover Cassette (pos 150) in the direction as shown in Figure 1.
- 2) Loosen 4 screws to remove the Cover Top (pos 240) by sliding it out towards the rear before lifting up.
  - 2 screws on the rear
  - 1 screw each on the left & right side
- 3) Loosen 2 screws each to remove the Panel Left (pos 180) and Panel Right (pos 181). The Panels are removed by sliding it towards the rear and outwards.
  - 1 screw on the rear
  - 1 screw on the side
  - see Service position A
- 4) Use a screw driver to give a push in the direction as shown in Figure 2 and Figure 2A to unlock the Loader Tray before sliding it out.
- 5) Slide out the Loader Tray and remove the Cover CD (pos 110 + pos 111) in the direction as shown in Figure 3.
- 6) Loosen 4 screws A (see Figure 4) to remove the Bracket Module Mounting (pos 156) and Universal Loader (pos 1103).
  - 2 screws each on the left & right side

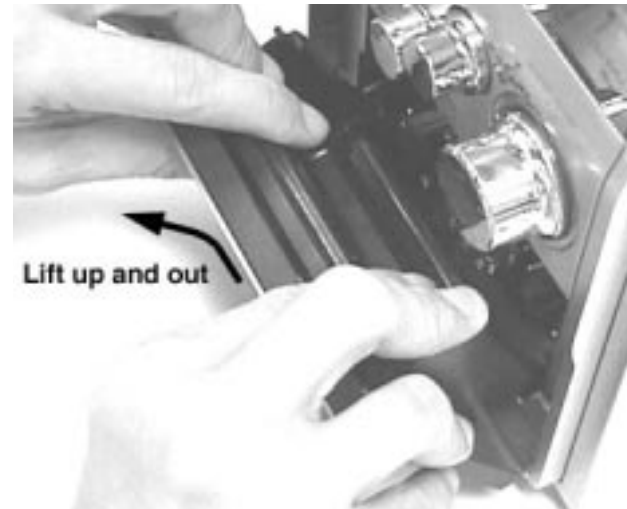


Figure 1

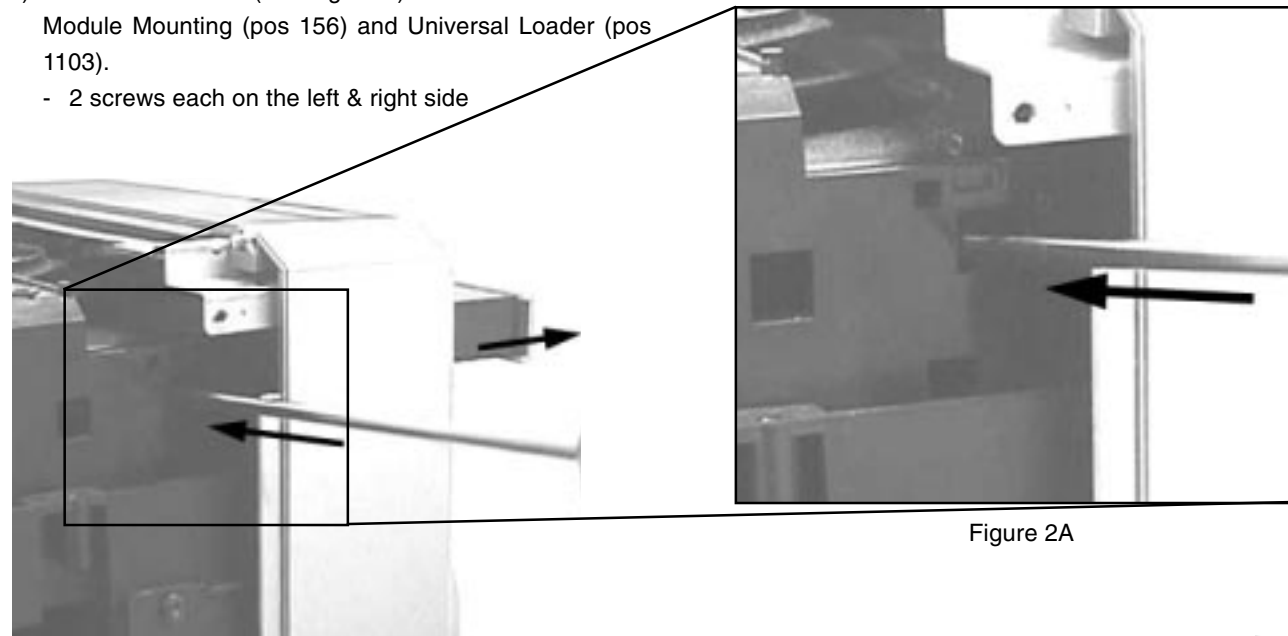


Figure 2



Figure 3

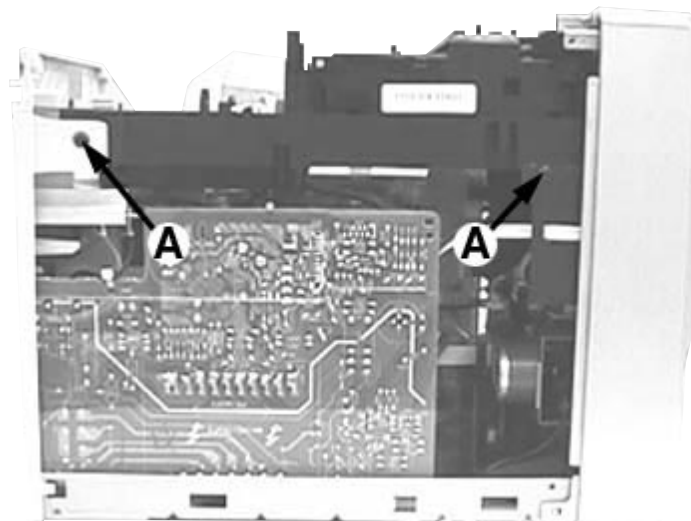


Figure 4

### *Detaching the Universal Loader from the Bracket Module Mounting*

- 1) Slide out the Loader Tray fully and remove 4 screws B (see Figure 5) to detach the Universal Loader (pos 1103) from the Bracket Module Mounting (pos 156).
  - see Service position B

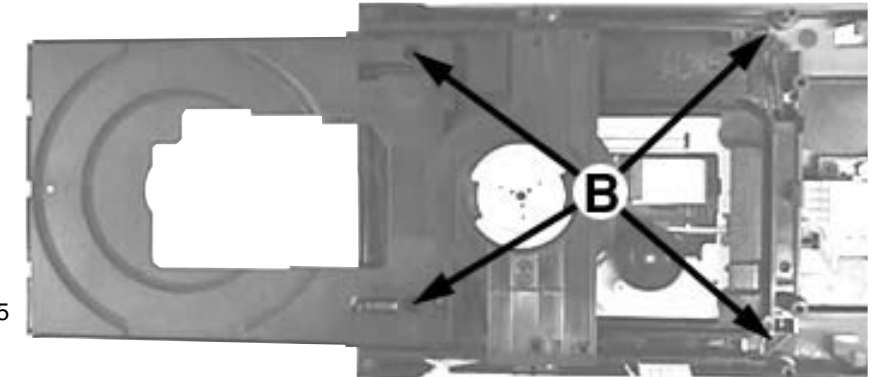


Figure 5

### *Detaching the Front Panel assembly from the Bottom/Rear assembly*

- 1) Remove 2 screws C (see Figure 6) from the bottom of the Cabinet Front (pos 101).
- 2) Release the fixation of the Combi Board (pos 1102-1003) to Bracket Combi (pos 155) by releasing the 2 catches C1 (see Figure 7) and pulling the Combi Board outwards as shown in Figure 7A.
- 3) Uncatch 2 catches C2 (see Figure 7) on the left & right sides of the Cabinet Front (pos 101) and slides the Front Panel assembly out towards the front.
  - see Service position C

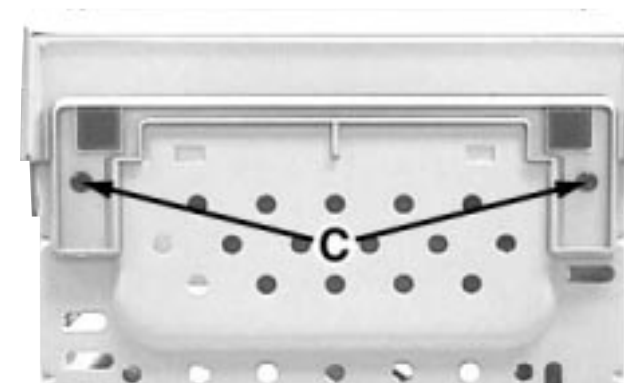


Figure 6

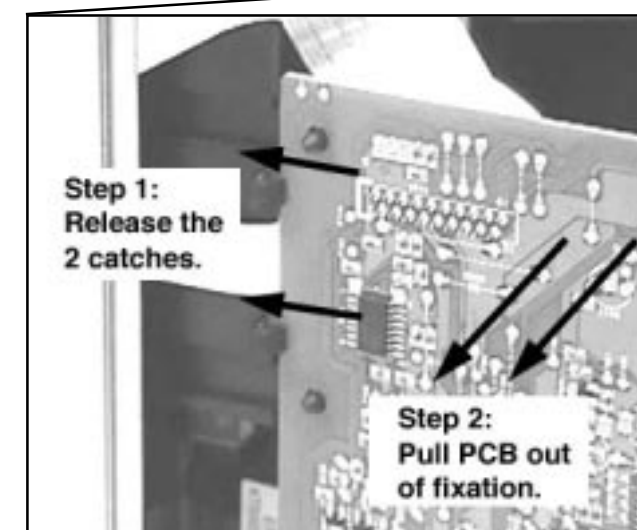


Figure 7A

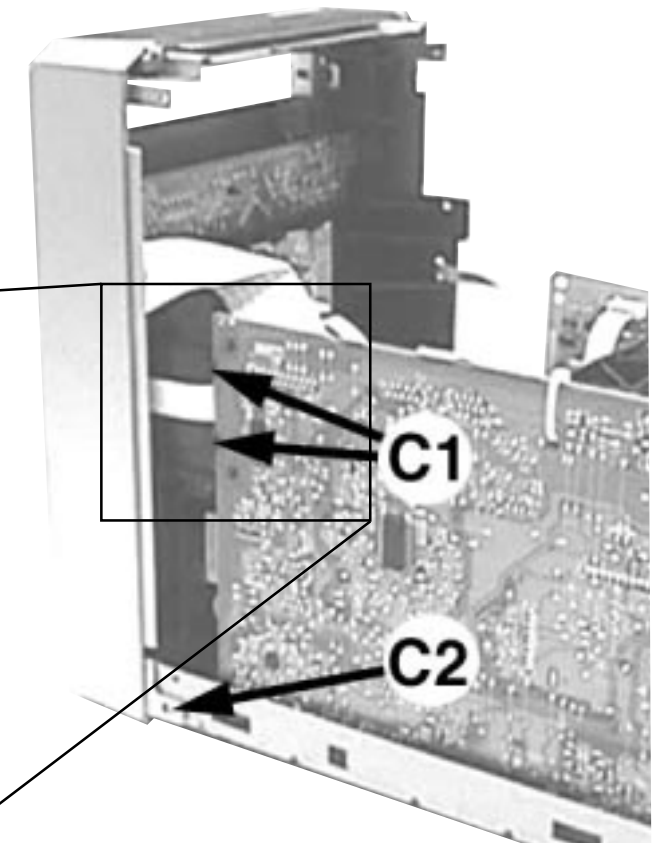


Figure 7

## DISMANTLING INSTRUCTIONS

### *Dismantling of the Front Panel assembly*

- 1) The Knob Volume (pos 141) can be remove by pulling it out in the direction as shown in Figure 8.
- 2) The Knob Bass/Knob Treble (pos 140) can be remove by pulling it out in the direction as shown in Figure 9.
- 3) Loosen 4 screws D (see Figure 12) to remove the Shield Tape Deck and Module Tape Deck (pos 1107).
- 4) Loosen 2 screws E (see Figure 11) to remove the Bracket Top Support (pos 113).



Figure 8



Figure 9

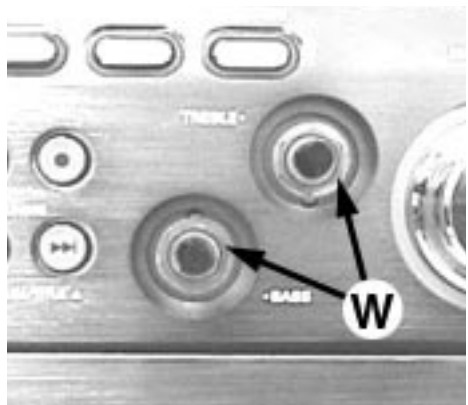


Figure 10

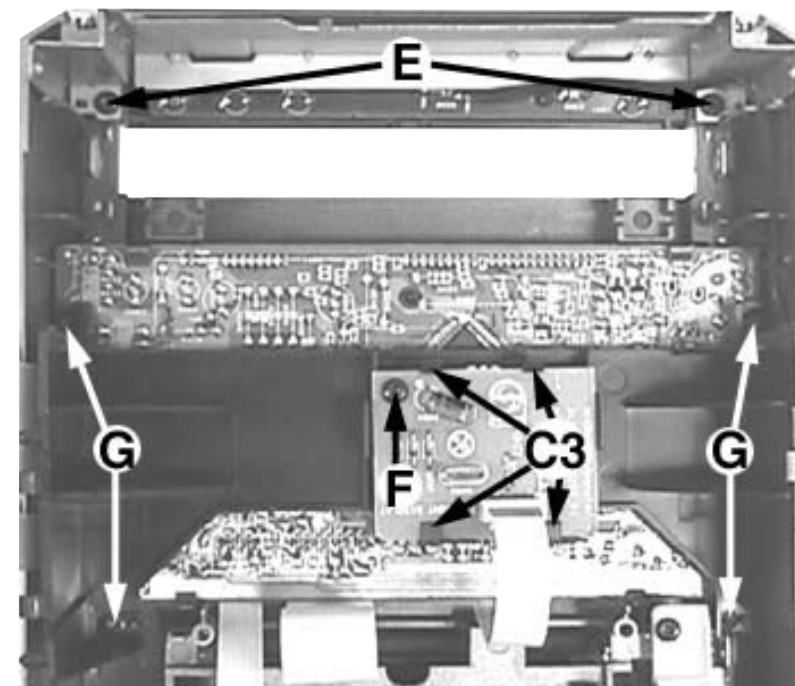


Figure 11

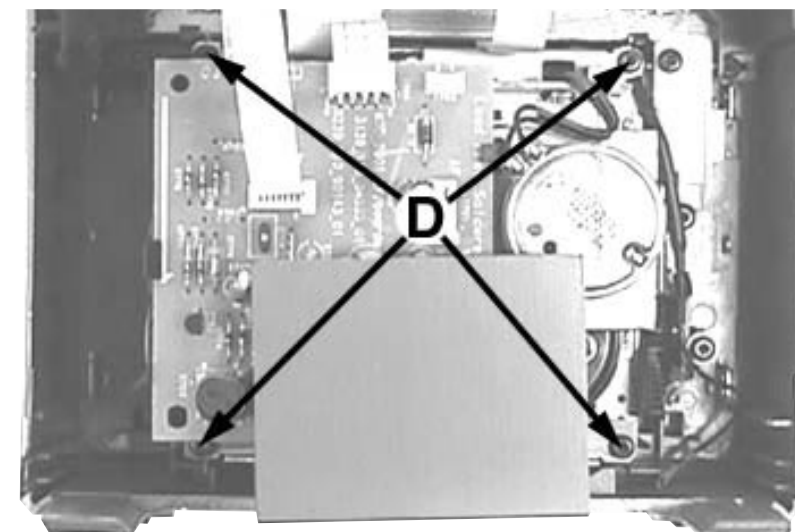


Figure 12

- 5) Loosen 1 screw F and 4 catches C3 (see Figure 11) to remove the Eeprom Board (pos 1105D).
- 6) Loosen 4 screws G (see Figure 11) to remove the Bracket Combi (pos 155).
- 7) Uncatch 4 catches C4 (see Figure 13) to remove the Display Board (pos 1105A).
- 8) Loosen 4 screws H (see Figure 13) to remove the Top Key Board (pos 1105C).
- 9) Loosen 5 screws J (see Figure 14) and 2 nuts W (see Figure 10) to remove the Control Board (pos 1105B).

### *Dismantling of the Front Panel assembly*

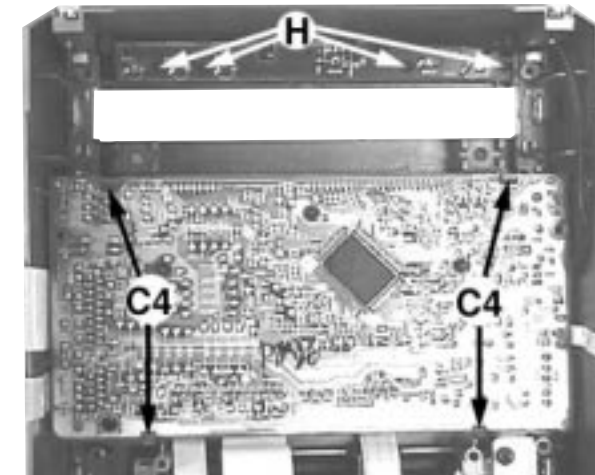


Figure 13



Figure 14

### *Dismantling of the Rear Panel assembly*

- 1) Loosen 3 screws K and 2 catches C5 (see Figure 15) to remove the Tuner Board assembly.
- 2) Loosen 3 screws L (see Figure 15) to free the Combi Board (pos 1102-1003).
- 3) Loosen 1 screw M (see Figure 15) to free the Mains Socket Board (pos 1102-1001B).

- 4) Loosen 1 screw N and 2 catches C6 (see Figure 15) to free the Panel Rear (pos 230) by sliding it out towards the rear.

*Note : Tuner Board assembly and Mains Socket Board can also be remove together with the Panel Rear.*

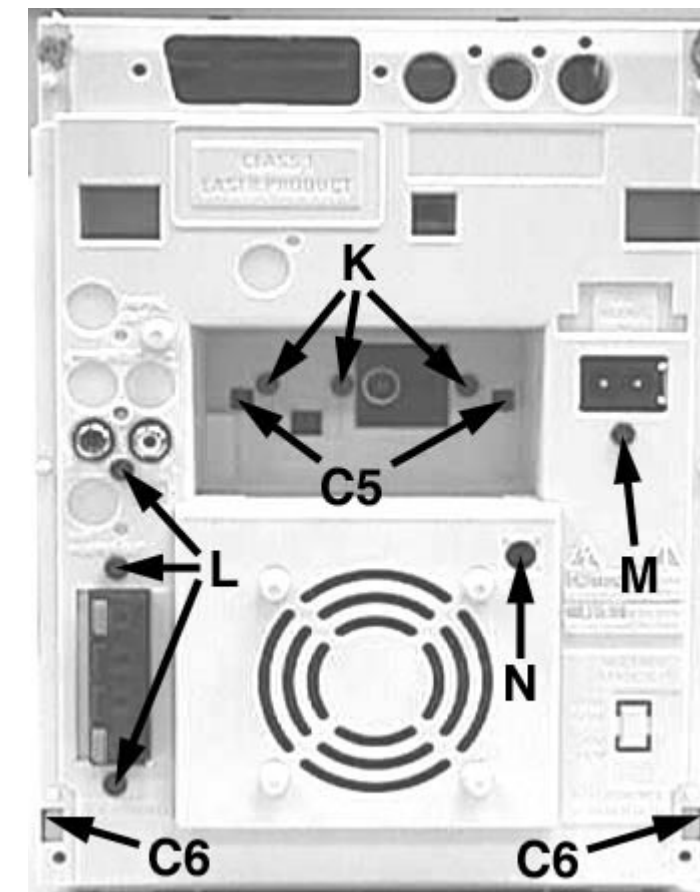


Figure 15

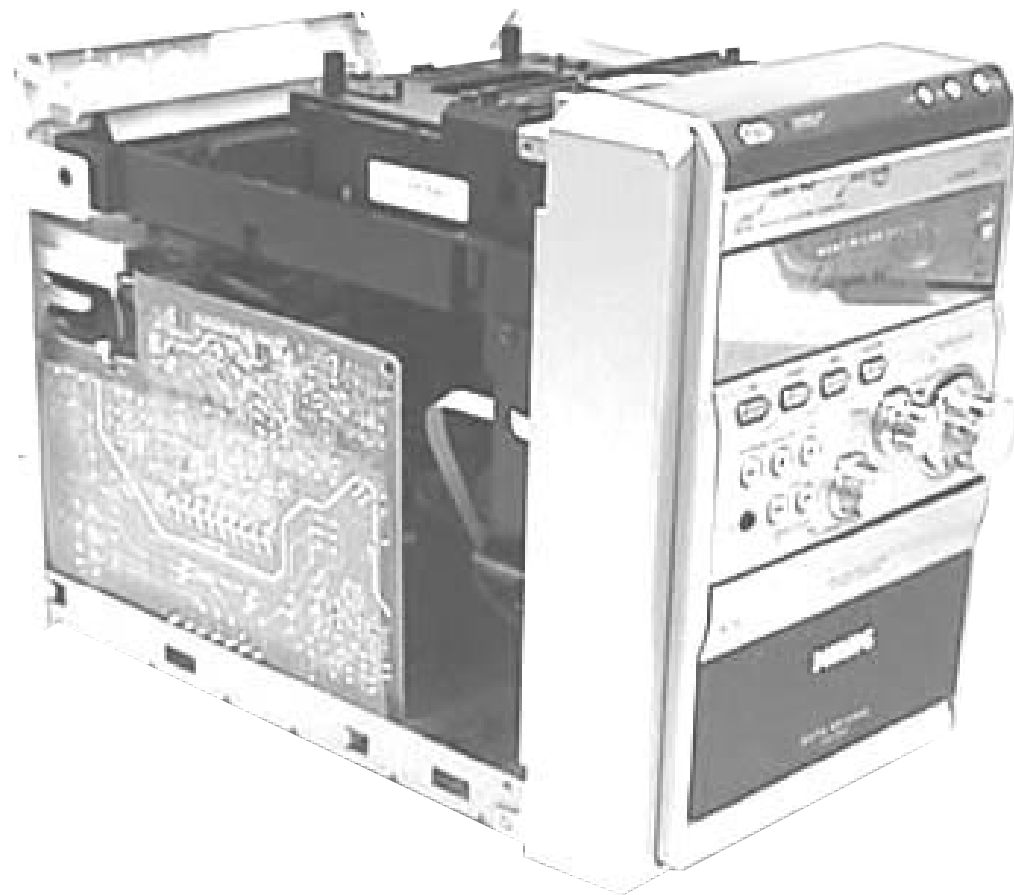
## DISMANTLING INSTRUCTIONS

### *Repair Hints & Service Positions*

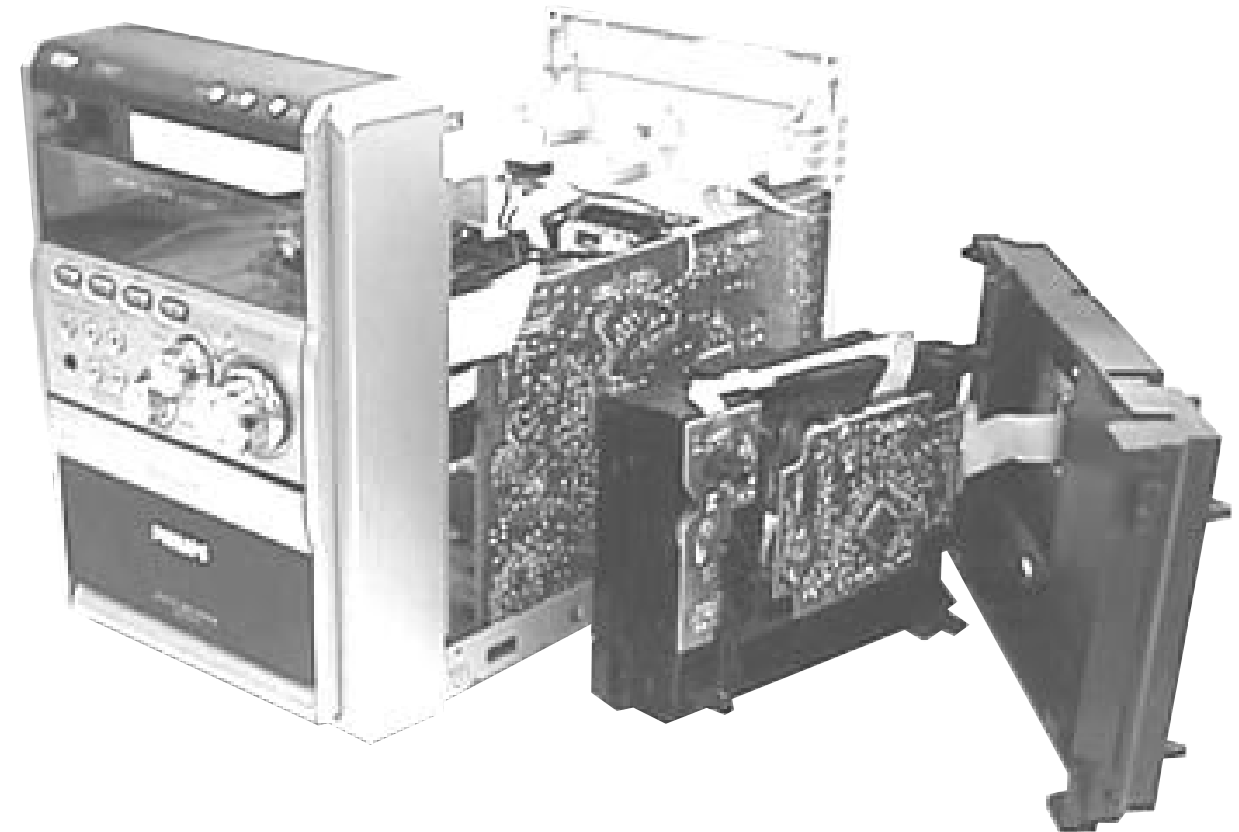
- 1) During repair it is possible to disconnect the Tuner Board and/or CD Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occur.

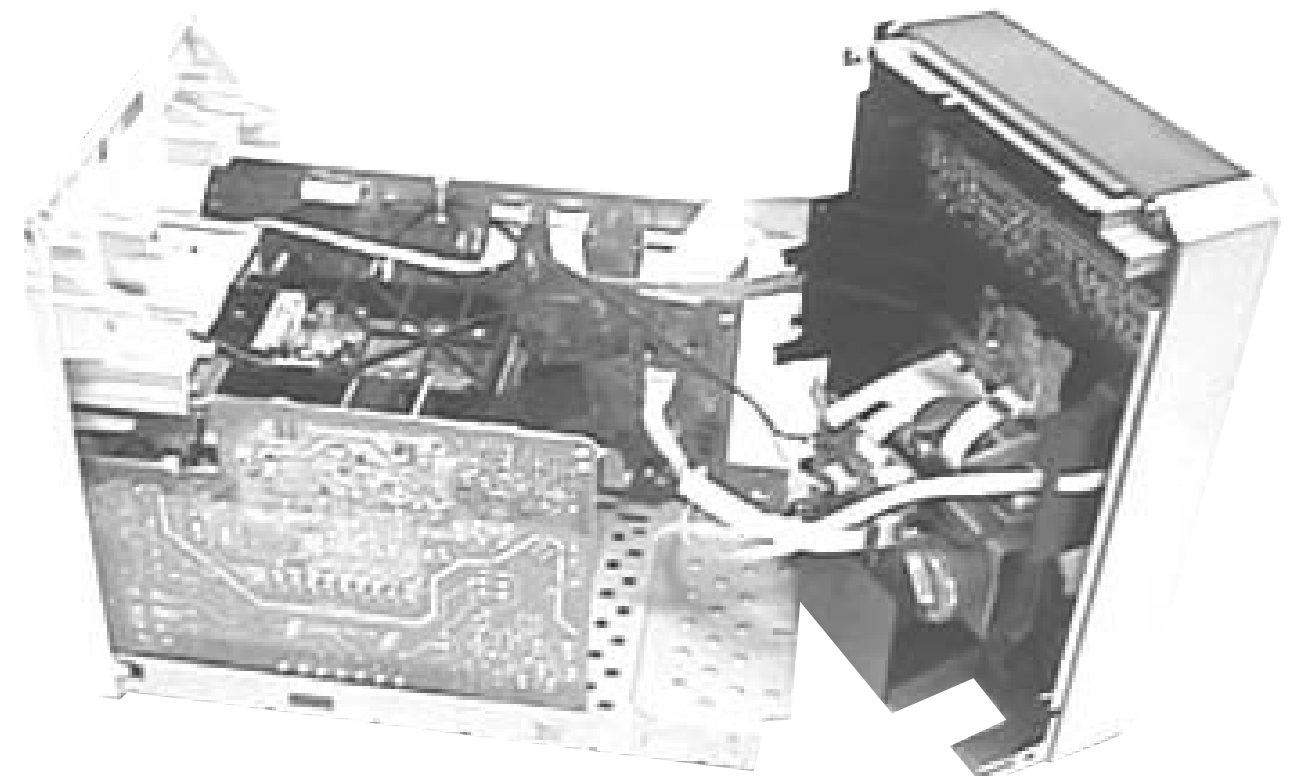
Service position A



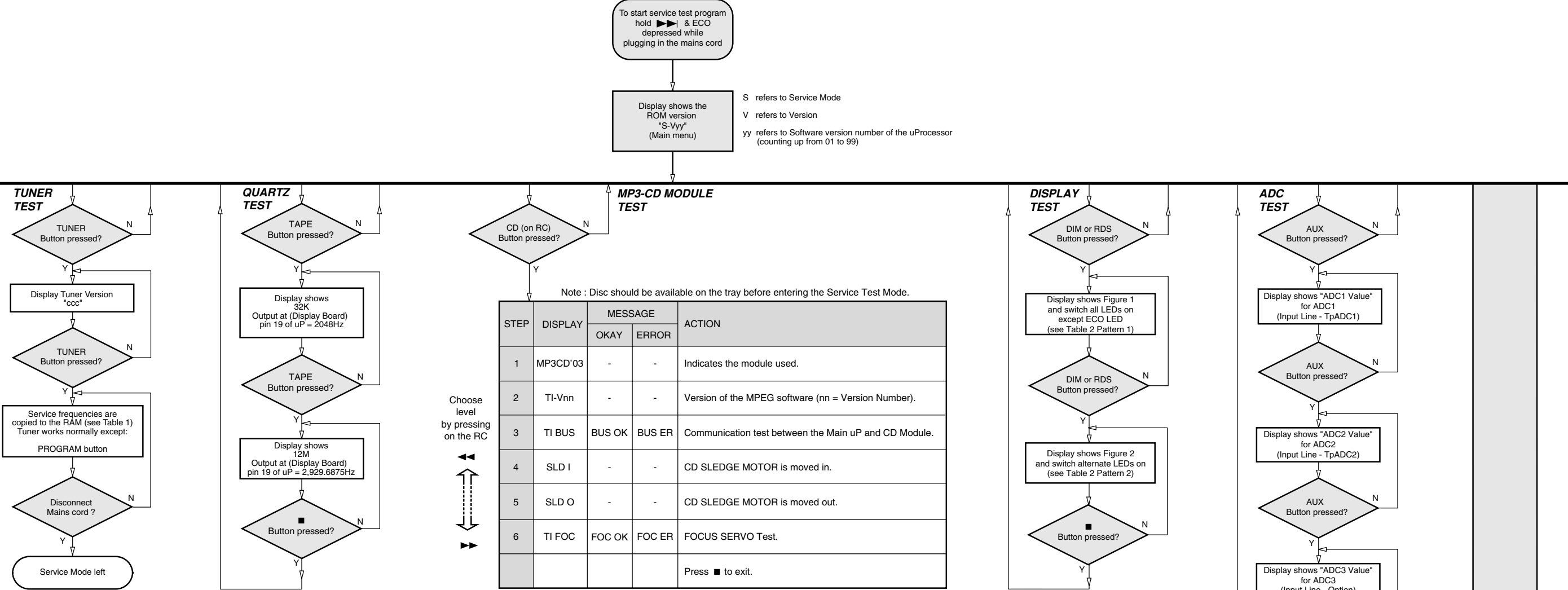
Service position B



Service position C



SERVICE TEST PROGRAM



PRESET	Europe "EUR"	East Europe "EAS"	East Eur. Extended-band "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	87.5MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	531kHz	74MHz	530kHz	531/530kHz*
4	1602kHz	1602kHz	87.5MHz	1700kHz	1602/1700kHz*
5	558kHz	558kHz	531kHz	560kHz	558/560kHz*
6	1494kHz	1494kHz	1602kHz	1500kHz	1494/1500kHz*
7	87.5MHz	87.5MHz	558kHz	98MHz	87.5/98MHz*
8	87.5MHz	87.5MHz	1494kHz	87.5MHz	87.5MHz
9	87.5MHz	87.5MHz	98MHz	87.5MHz	87.5MHz
10	87.5MHz	87.5MHz	70.01MHz	87.5MHz	87.5MHz
11	98MHz	98MHz	65.81MHz	87.5MHz	98/87.5MHz*

Table 1

Note: \* Depending on the selected grid frequency (9 or 10kHz).  
By holding the ECO and TUNER buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:  
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.  
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

LEDs	Pattern 1	Pattern 2
ECO	Off	Off
CD	On	On
TUNER	On	Off
TAPE	On	On
AUX	On	Off
Volume Rotary	On	On

Table 2



Figure 1

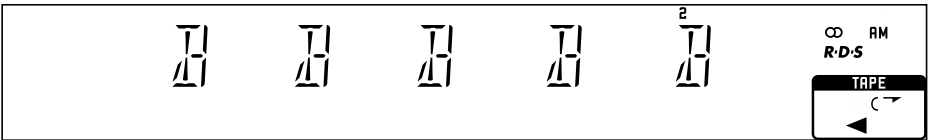


Figure 2

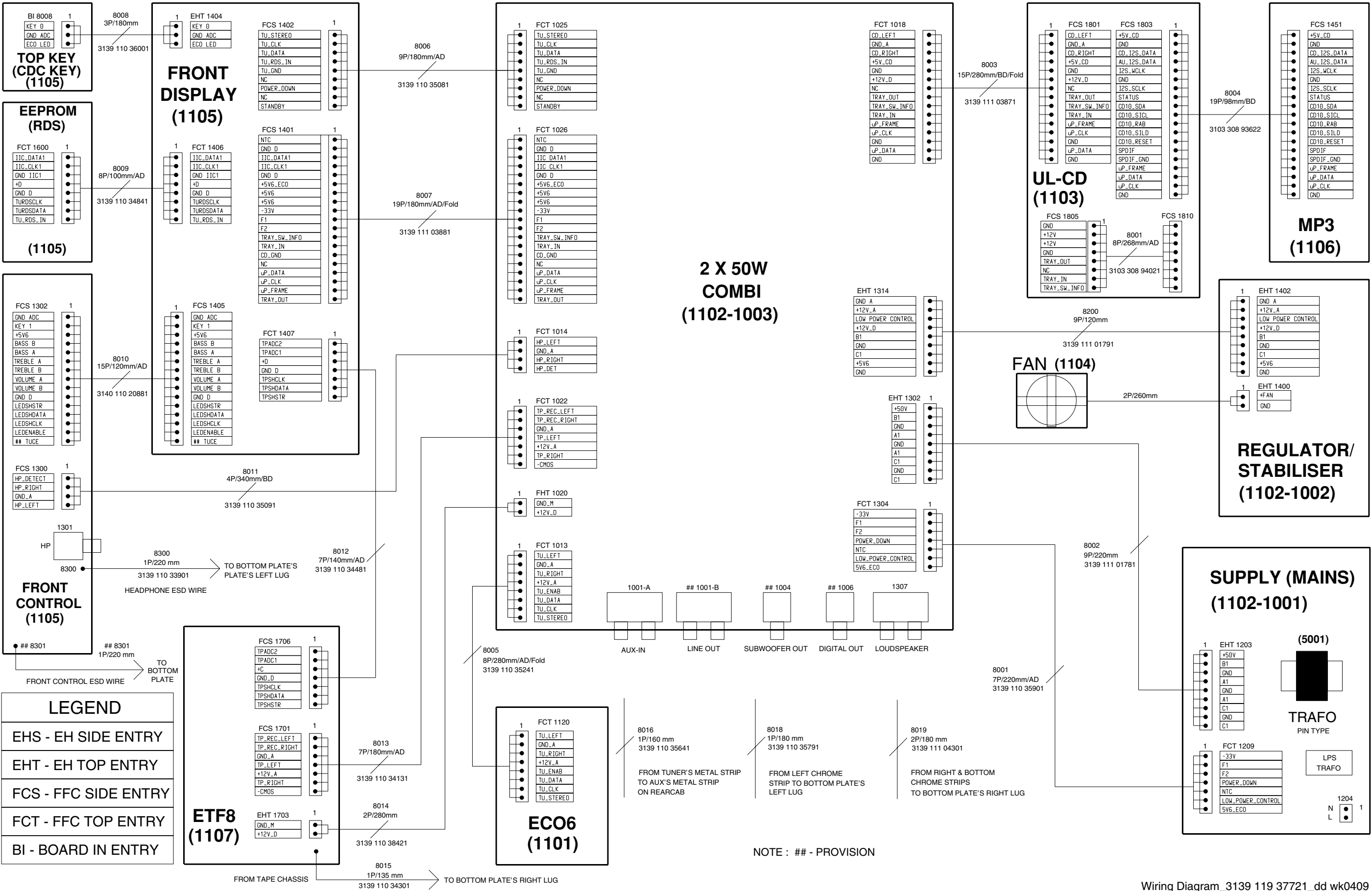
ADC Test is used for checking the ADC inputs to the microprocessor.  
The display shows an ADC value between 0 and 255 for an input signal between 0 and 5V.

TEST	Activated with	ACTION
EEPROM TEST	►►  ■ to Exit	Test patterns will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test patterns correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT TEST	◄◄	Load default data. Display shows "NEW" for 1 second. <b>Caution! All presets from the customer will be lost!!</b>
DEMO TOGGLE	►	Pressing this button will toggle between DEMO ON and DEMO OFF. The DEMO status will scroll once across the Display.
ROTARY ENCODER TEST	Volume, Treble or Bass Knob	Display shows value for 2 seconds. Values increases or decreases until Volume Maximum (0dB) or Volume Minimum (VOL MUTE) is reached.
LEAVE SERVICE TEST PROGRAM	Disconnect mains cord	





SET WIRING DIAGRAM





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# FRONT BOARD

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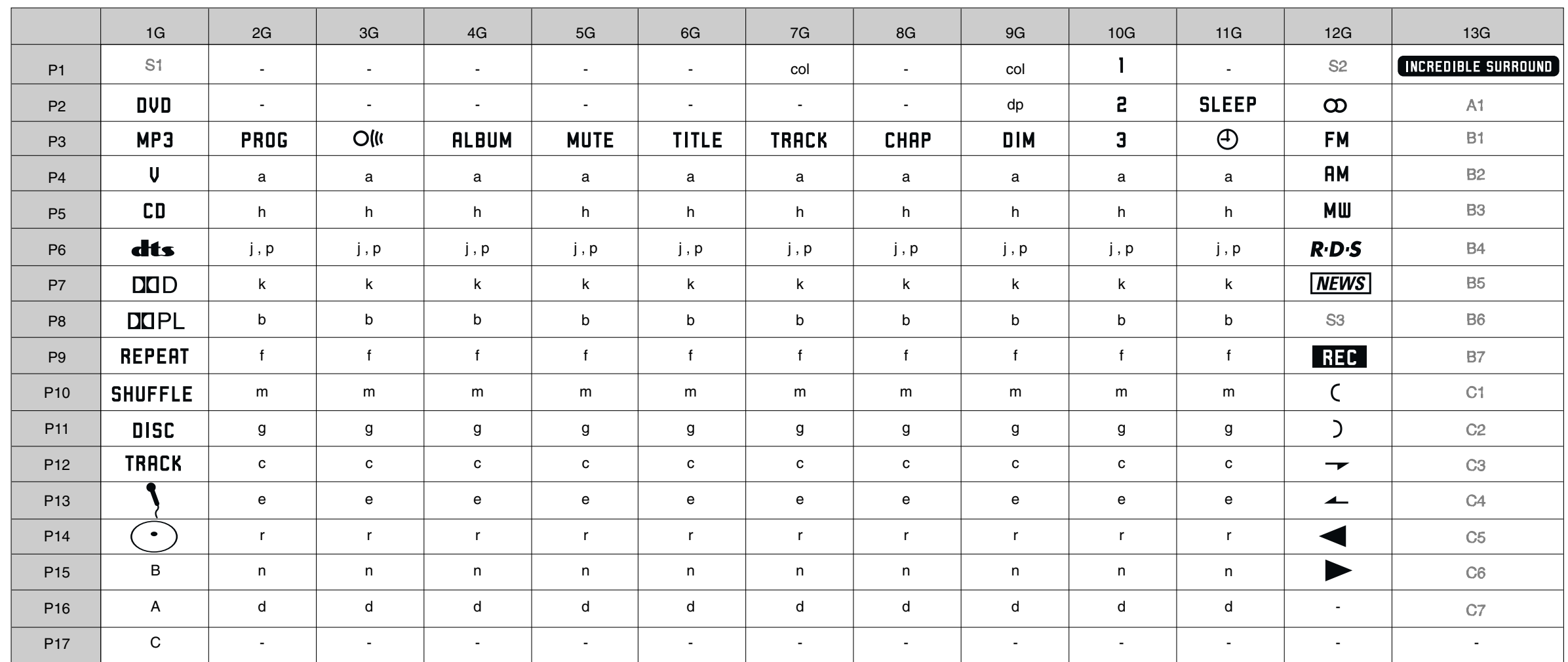
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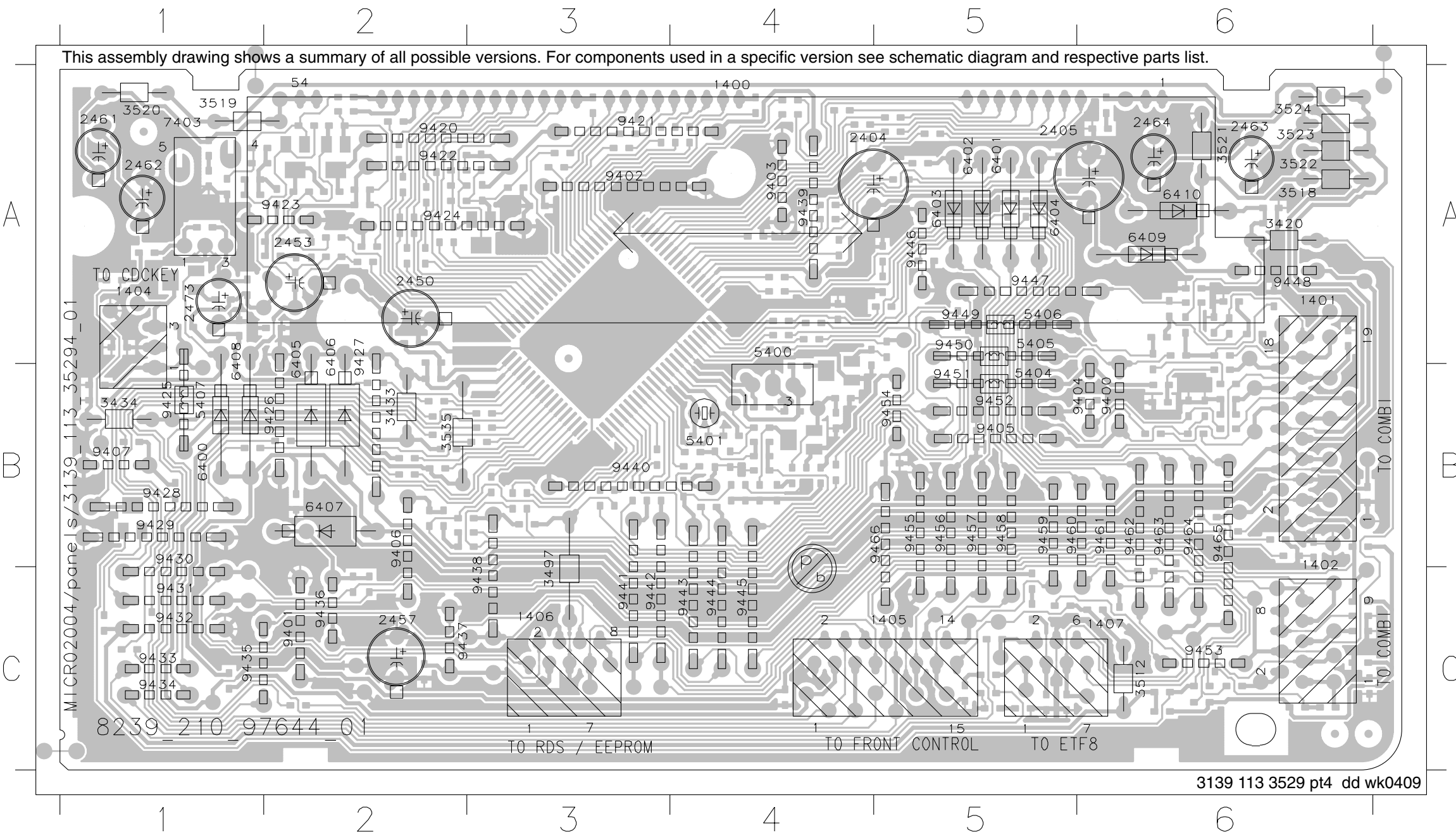
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Electrical parts list ..... 6-14



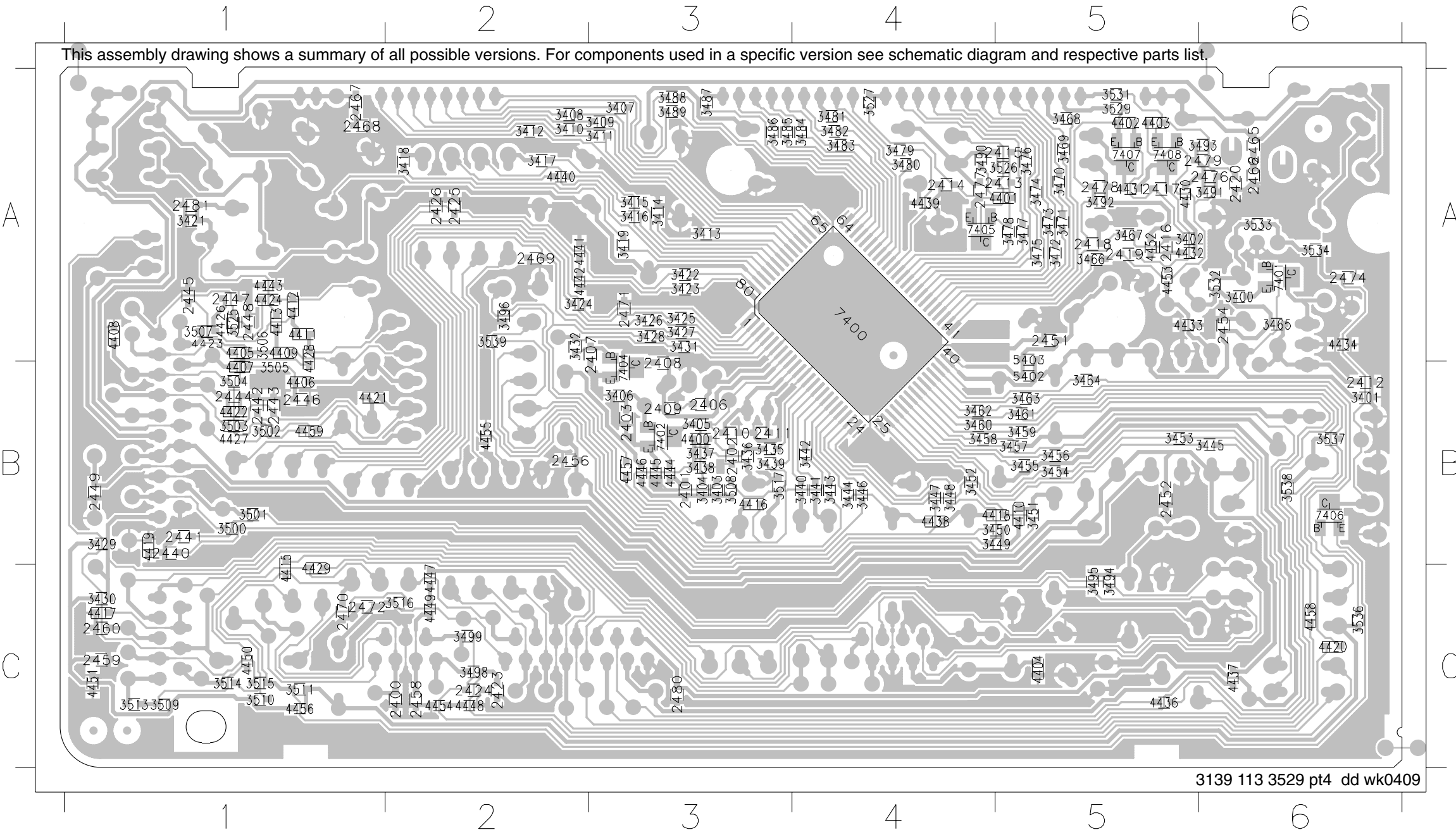
DISPLAY BOARD - COMPONENT LAYOUT

1400	A4	2405	A5	2473	A1	3520	A1	5404	B5	6404	A5	9400	B6	9420	A2	9428	B1	9436	C2	9444	C4	9452	B5	9460	B5
1401	A6	2450	A2	3420	A6	3521	A6	5405	A5	6405	A2	9401	C2	9421	A3	9429	B1	9437	C2	9445	C4	9453	C6	9461	B6
1402	B6	2453	A2	3433	B2	3522	A6	5406	A5	6406	A2	9402	A3	9422	A2	9430	B1	9438	C3	9446	A5	9454	B5	9462	B6
1404	A1	2457	C2	3434	B1	3523	A6	5407	B1	6407	B2	9403	A4	9423	A2	9431	C1	9439	A4	9447	A5	9455	B5	9463	B6
1405	C5	2461	A1	3497	C3	3524	A6	6400	B1	6408	A1	9404	B6	9424	A2	9432	C1	9440	B3	9448	A6	9456	B5	9464	B6
1406	C3	2462	A1	3512	C6	3535	B2	6401	A5	6409	A6	9405	B5	9425	B1	9433	C1	9441	C3	9449	A5	9457	B5	9465	B6
1407	C6	2463	A6	3518	A6	5400	A4	6402	A5	6410	A6	9406	B2	9426	B2	9434	C1	9442	C3	9450	A5	9458	B5	9466	B5
2404	A4	2464	A6	3519	A1	5401	B4	6403	A5	7403	A1	9407	B1	9427	A2	9435	C1	9443	C4	9451	B5	9459	B5		



DISPLAY BOARD - CHIP LAYOUT

2400	C2	2423	C2	2459	C1	3402	A5	3422	A3	3443	B4	3462	B4	3481	A4	3501	B1	3529	A5	4410	B5	4431	A5	4451	C1
2401	B3	2424	C2	2460	C1	3403	B3	3423	A3	3444	B4	3463	B5	3482	A4	3502	B1	3531	A5	4411	A1	4432	A5	4452	A5
2402	B3	2425	A2	2465	A6	3404	B3	3424	A2	3445	B6	3464	B5	3483	A4	3503	B1	3532	A6	4412	A1	4433	A5	4453	A5
2403	B3	2426	A2	2466	A6	3405	B3	3425	A3	3446	B4	3465	A6	3484	A4	3504	B1	3533	A6	4413	A1	4434	A6	4454	C2
2406	B3	2440	B1	2467	A1	3406	B3	3426	A3	3447	B4	3466	A5	3485	A3	3505	B1	3534	A6	4415	C1	4436	C5	4455	B2
2407	A3	2441	B1	2468	A1	3407	A3	3427	A3	3448	B4	3467	A5	3486	A3	3506	A1	3536	C6	4416	B3	4437	C6	4456	C1
2408	B3	2442	B1	2469	A2	3408	A2	3428	A3	3449	B5	3468	A5	3487	A3	3507	A1	3537	B6	4417	C1	4438	B4	4457	B3
2409	B3	2443	B1	2470	C1	3409	A3	3429	B1	3450	B5	3469	A5	3488	A3	3508	B3	3538	B6	4418	B5	4439	A4	4458	C6
2410	B3	2444	B1	2471	A3	3410	A2	3430	C1	3451	B5	3470	A5	3489	A3	3509	C1	3539	A2	4419	B1	4440	A2	4459	B1
2411	B3	2445	A1	2472	C1	3411	A3	3431	A3	3452	B4	3471	A5	3490	A4	3510	C1	4400	B3	4420	C6	4441	A2	5402	B5
2412	B6	2446	B1	2474	A6	3412	A2	3432	A2	3453	B5	3472	A5	3491	A6	3511	C1	4401	A5	4421	B1	4442	A2	5403	A5
2413	A5	2447	A1	2476	A6	3413	A3	3435	B3	3454	B5	3473	A5	3492	A5	3513	C1	4402	A5	4422	B1	4443	A1	7400	A4
2414	A4	2448	A1	2477	A4	3414	A3	3436	B3	3455	B5	3474	A5	3493	A6	3514	C1	4403	A5	4423	A1	4444	B3	7401	A6
2415	A5	2449	B1	2478	A5	3415	A3	3437	B3	3456	B5	3475	A5	3494	C5	3515	C1	4404	C5	4424	A1	4445	B3	7402	B3
2416	A5	2451	A5	2479	A6	3416	A3	3438	B3	3457	B5	3476	A5	3495	C5	3516	C2	4405	A1	4426	A1	4446	B3	7404	B3
2417	A5	2452	B5	2480	C3	3417	A2	3439	B3	3458	B4	3477	A5	3496	A2	3517	B3	4406	B1	4427	B1	4447	C2	7405	A4
2418	A5	2454	A6	2481	A1	3418	A2	3440	B4	3459	B5	3478	A5	3498	C2	3525	A1	4407	B1	4428	A1	4448	C2	7406	B6
2419	A5	2456	B2	3400	A6	3419	A3	3441	B4	3460	B4	3479	A4	3499	C2	3526	A5	4408	A1	4429	C1	4449	C2	7407	A5
2420	A6	2458	C2	3401	B6	3421	A1	3442	B4	3461	B5	3480	A4	3500	B1	3527	A4	4409	A1	4430	A5	4450	C1	7408	A5



ECO LED

TO CDC KEY

TO FRONT CONTROL

RESET

IR EYE

POWER-DOWN

TO RDS / EEPROM

TO ETF8

Legend :

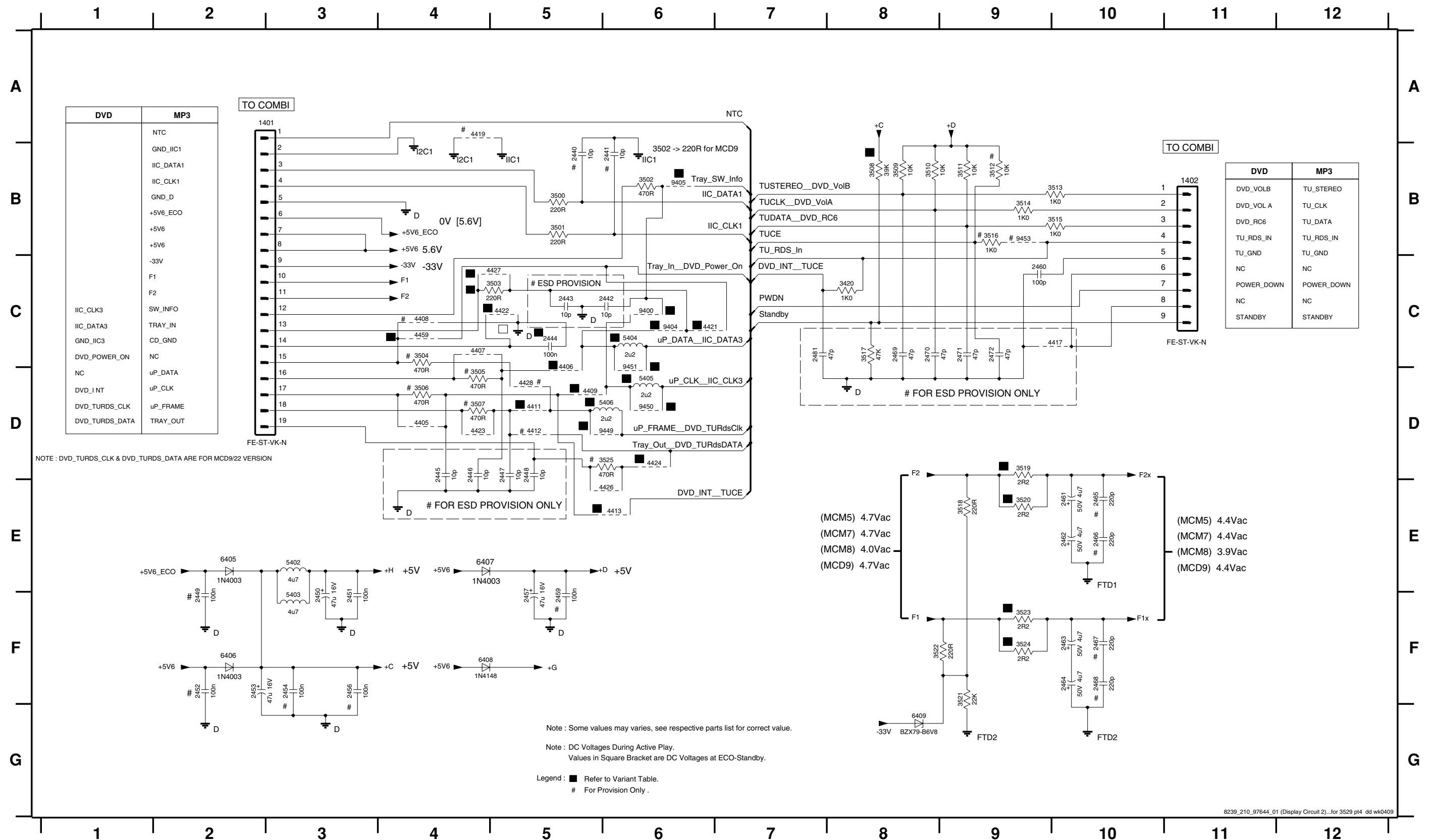
Note : Some values may varies, see respective parts list for correct value.

Note : DC Voltages During Active Play.  
Values in Square Bracket are DC Voltages at ECO-Standby.  
Values in Bracket are DC Voltages at Standby (Clock Mode).

8239\_210\_97644\_01 (Display Circuit 1)...for 3529 pt4 dd wk0409

1400 A13	3473 C7
1404 C1	3474 C7
1405 E1	3475 C7
1406 E13	3476 C7
1407 G13	3477 C7
2400 H12	3478 C6
2401 H1	3479 C6
2402 H2	3480 C6
2403 F1	3481 C6
2404 F4	3482 C6
2405 F4	3483 C6
2406 F4	3484 C6
2407 H5	3485 C5
2408 H6	3486 C5
2409 H6	3487 C5
2410 G6	3488 C5
2411 G6	3489 C5
2412 C2	3490 C10
2413 C10	3491 C13
2414 C10	3492 C12
2415 C9	3493 C13
2416 C11	3494 E12
2417 C11	3495 E12
2418 C12	3496 H5
2419 C13	3497 H10
2420 C13	3498 G12
2423 H11	3499 G12
2424 H12	3526 C10
2425 H12	3527 C10
2426 H12	3529 C12
2428 H11	3531 C13
2453 H4	3532 H4
2474 I4	3533 H4
2476 C12	3534 I4
2477 C10	3535 D9
2478 C11	3536 A3
2479 C12	3537 D10
2480 D9	3538 D10
3400 A1	3539 B9
3401 B1	4400 I8
3402 C11	4401 C10
3403 H1	4402 C11
3404 H1	4403 C13
3405 H2	4404 H4
3406 I1	4410 F9
3407 C4	4415 B3
3408 C4	4416 B4
3409 C4	4418 A2
3410 D4	4420 E10
3411 D3	4429 B3
3412 D4	4436 D10
3413 C4	4457 G5
3414 E4	4458 E10
3415 E6	5400 G6
3416 E4	5401 G6
3417 E3	5407 C2
3418 F4	6400 A1
3419 F4	6401 E3
3421 F3	6402 E4
3422 G4	6403 E4
3423 G4	6404 F4
3424 G4	6410 F3
3425 G4	7400 H8
3426 G4	7402 H8
3427 G4	7402 H8
3428 G5	7403 H3
3429 G5	7404 H6
3430 H3	7405 C10
3431 H5	7406 A3
3432 H5	7407 C12
3433 H7	7408 C13
3434 I7	9401 H4
3435 H8	9402 B8
3436 I8	9403 B8
3437 H9	9406 G10
3438 I9	9407 D10
3439 I9	9425 C2
3440 H8	
3441 H8	
3442 G8	
3443 G9	
3444 G8	
3445 G8	
3446 G9	
3447 G9	
3448 G8	
3449 F9	
3450 F9	
3451 F10	
3452 F9	
3453 F9	
3454 F9	
3455 F9	
3456 F9	
3457 E9	
3458 E9	
3459 E9	
3460 E9	
3461 E9	
3462 E9	
3463 E9	
3464 D9	
3465 C2	
3466 C8	
3467 C8	
3468 C8	
3469 C8	
3470 C8	
3471 C7	
3472 C7	

1401 A3	2442 C6	2446 D4	2450 F3	2454 F3	2460 C9	2464 F10	2468 F10	2472 C9	3501 B5	3505 D4	3509 B8	3513 B10	3517 C8	3521 F9	3525 D6	4408 C4	4413 E6	4422 C5	4427 C5	5403 F3	6405 E2	6409 G8	9449 D6
1402 B11	2443 C5	2447 D5	2451 F3	2456 F3	2461 E10	2465 E10	2469 C8	2481 C7	3502 B6	3506 D4	3510 B8	3514 B9	3518 E9	3522 F8	4405 D4	4409 D5	4417 C10	4423 D4	4428 D5	5404 C6	6406 F2	9400 C6	9450 D6
2440 B5	2444 C5	2448 D5	2452 F2	2457 F5	2462 E10	2466 E10	2470 C8	3420 C8	3503 C5	3507 D4	3511 B9	3515 B10	3519 D9	3523 F9	4406 D5	4411 D5	4419 A4	4424 D6	4459 C4	5405 D6	6407 E4	9404 C6	9451 D6
2441 B6	2445 D4	2449 F2	2453 F2	2459 F5	2463 F10	2467 F10	2471 C9	3500 B5	3504 C4	3508 B8	3512 B9	3516 B9	3520 E9	3524 F9	4407 C4	4412 D5	4421 C6	4426 E6	5402 E3	5406 D6	6408 F4	9405 B6	9453 B9

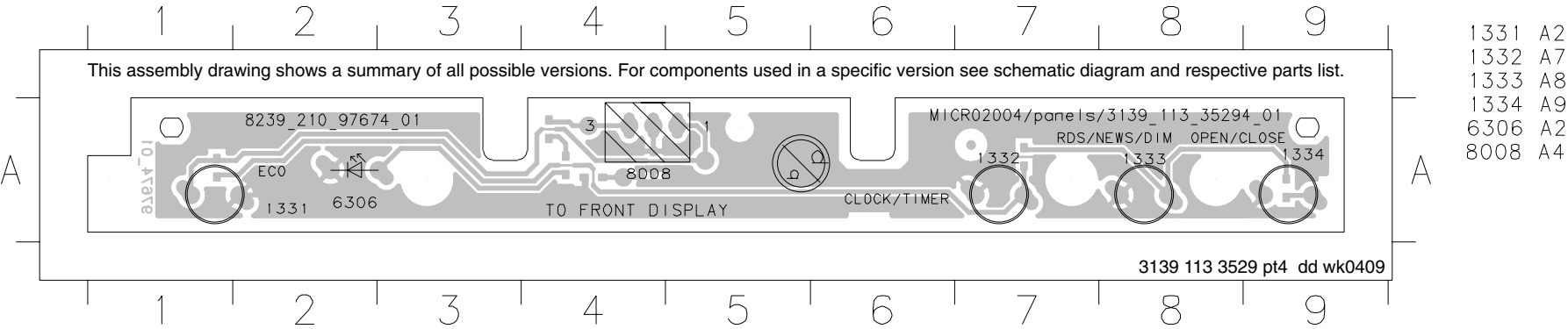


DISPLAY BOARD - VARIANT TABLE

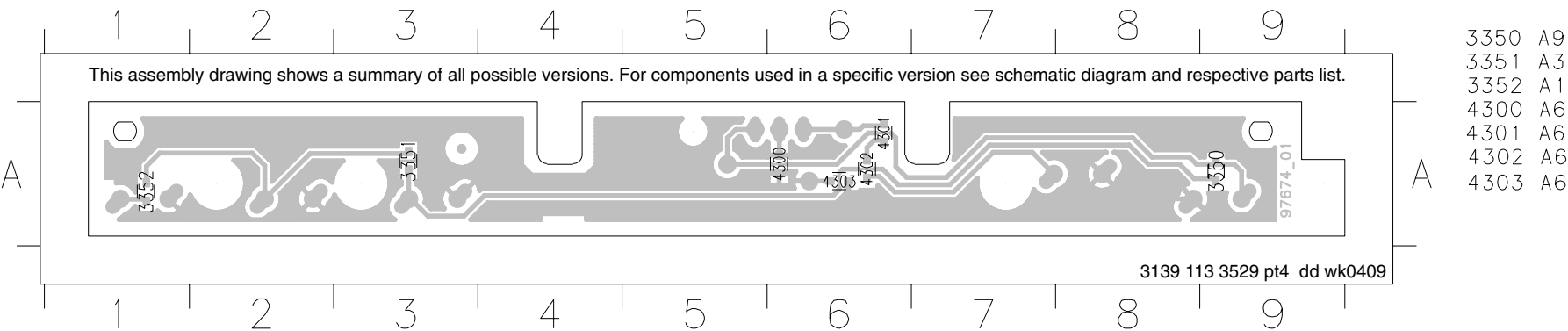
	MCM7/22	MCM7/37	MCM8/22	MCM8/21
2444	100N	100N	100N	100N
3434	180R	180R	470R	470R
3436	1M	1M	2M2	2M2
3437	680K	680K	-	-
3438	1M	1M	-	-
3496	-	10K	-	10K
3497	-	10K	-	10K
3503	-	-	-	-
3508	39K	39K	-	-
3519	2R2	2R2	1R	1R
3520	2R2	2R2	1R	1R
3523	2R2	2R2	1R	1R
3524	2R2	2R2	1R	1R
4400	-	-	X	X
4406	X	X	X	X
4409	X	X	X	X
4411	X	X	X	X
4413	-	-	-	-
4420	X	X	X	X
4421	X	X	X	X
4422	-	-	-	-
4424	X	X	X	X
4427	X	X	X	X
4438	X	-	X	-
4457	X	-	X	-
4458	X	X	X	X
4459	-	-	-	-
5404	2U2	2U2	2U2	2U2
5405	2U2	2U2	2U2	2U2
5406	2U2	2U2	2U2	2U2
9400	-	-	-	-
9404	-	-	-	-
9405	X	X	X	X
9449	-	-	-	-
9450	-	-	-	-
9451	-	-	-	-

X - Item in use.

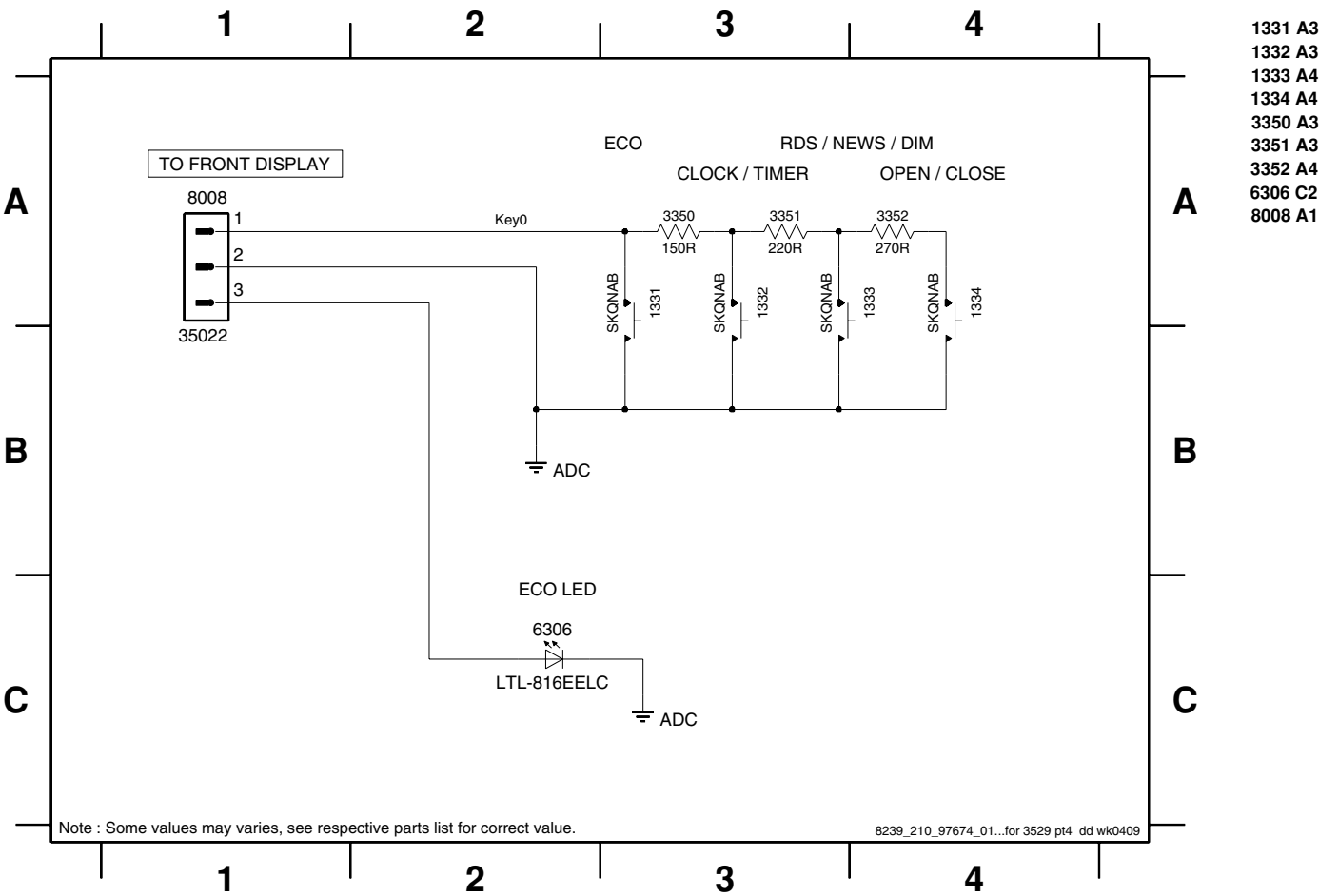
TOP KEY BOARD - COMPONENT LAYOUT



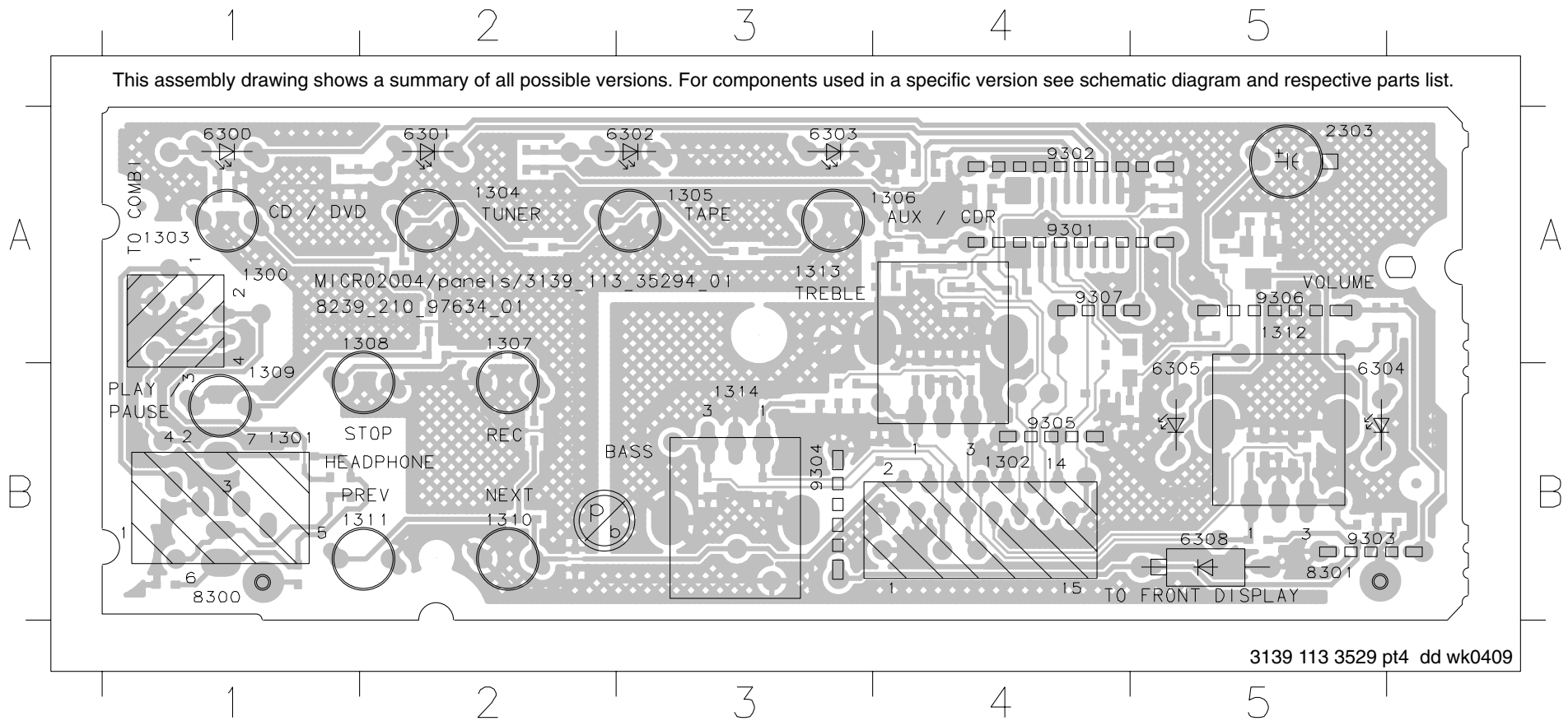
TOP KEY BOARD - CHIP LAYOUT



TOP KEY BOARD - CIRCUIT DIAGRAM

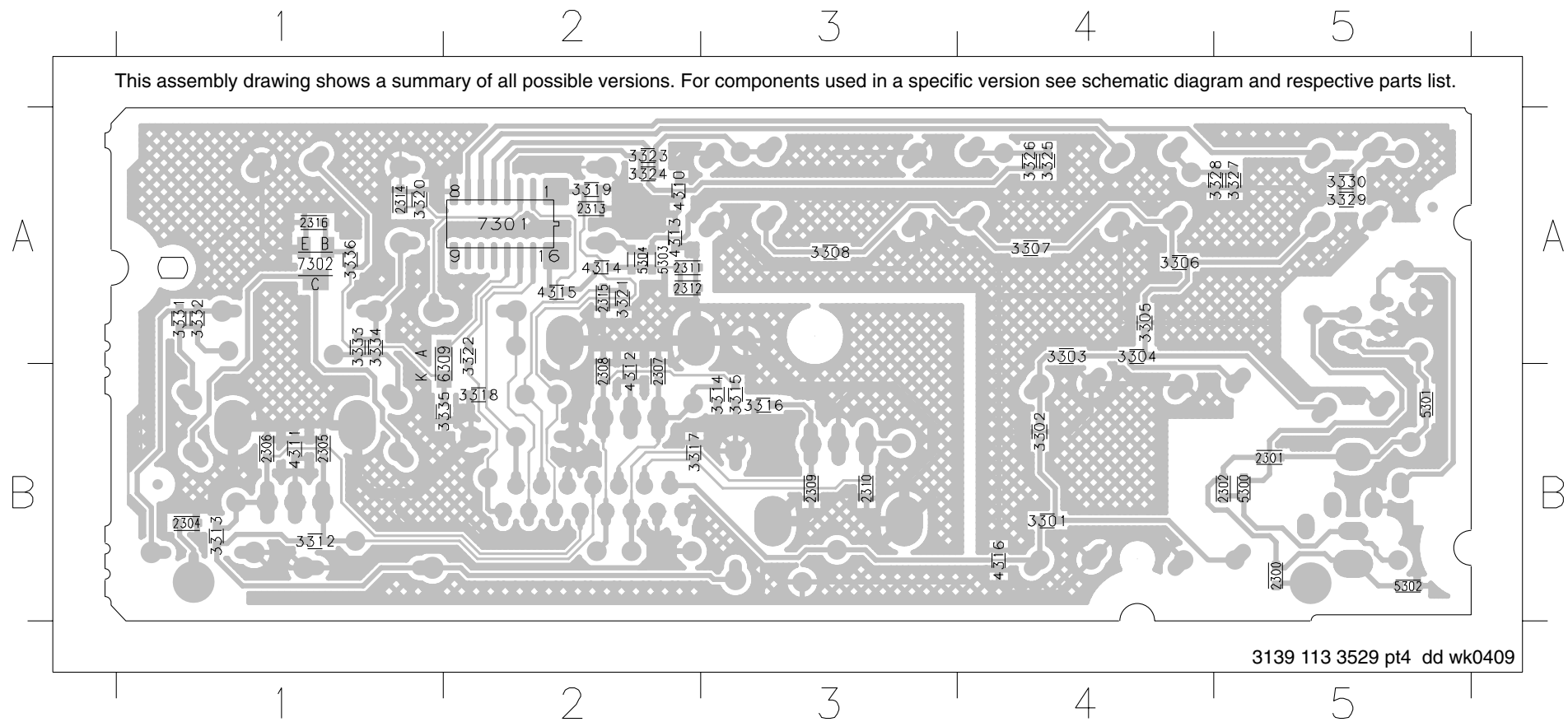


CONTROL BOARD - COMPONENT LAYOUT



1300	A1	9305	B4
1301	B1	9306	A5
1302	B4	9307	A4
1303	A1		
1304	A2		
1305	A3		
1306	A4		
1307	A2		
1308	A2		
1309	B1		
1310	B2		
1311	B2		
1312	A5		
1313	A3		
1314	B3		
2303	A5		
6300	A1		
6301	A2		
6302	A3		
6303	A3		
6304	B5		
6305	B5		
6308	B5		
8300	B1		
8301	B5		
9301	A4		
9302	A4		
9303	B5		
9304	B3		

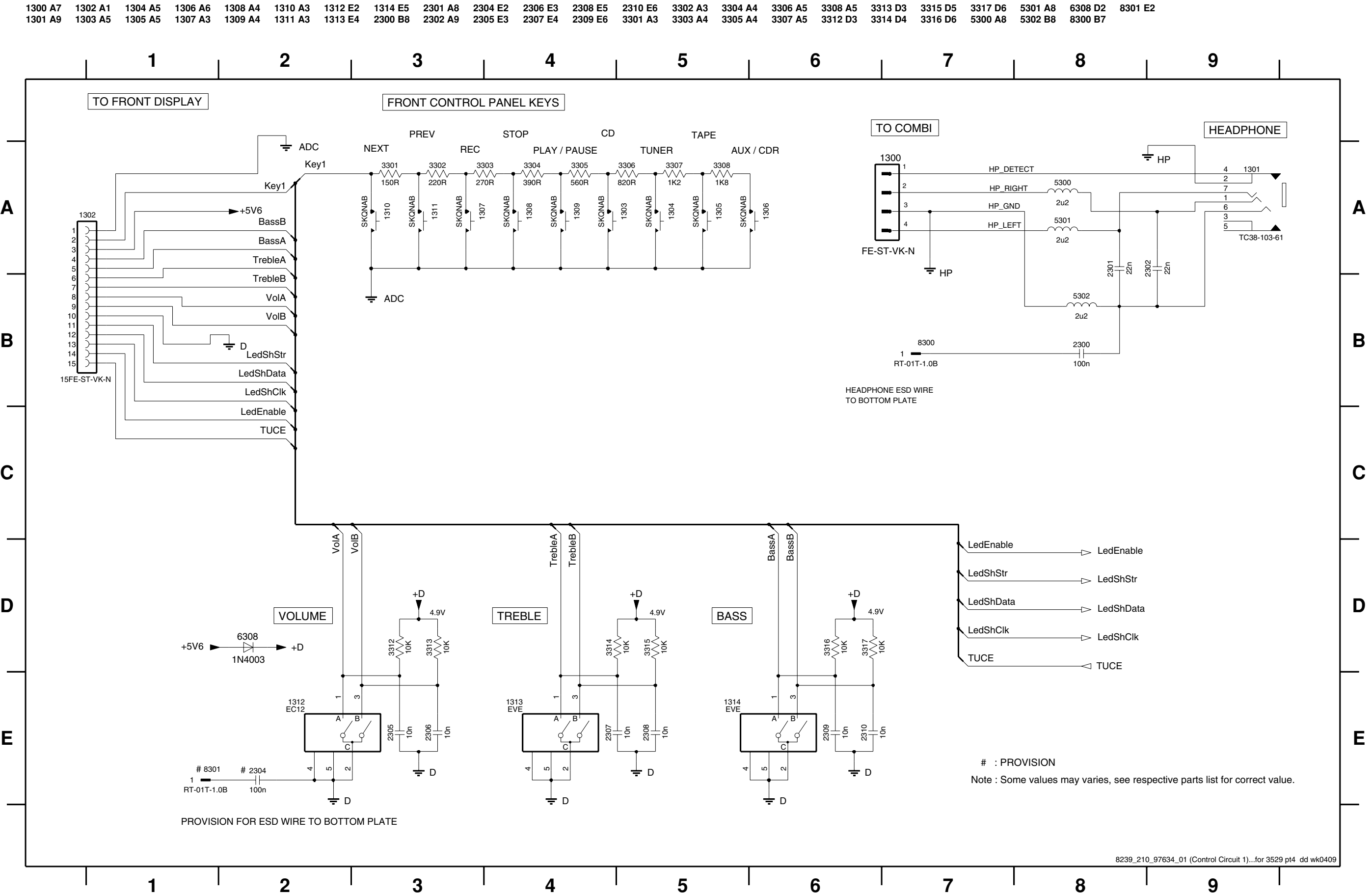
CONTROL BOARD - CHIP LAYOUT



2300	B5	3317	B2	5302	B5
2301	B5	3318	B2	5303	A2
2302	B5	3319	A2	5304	A2
2304	B1	3320	A1	6309	A1
2305	B1	3321	A2	7301	A2
2306	B1	3322	A2	7302	A1
2307	B2	3323	A2		
2308	B2	3324	A2		
2309	B3	3325	A4		
2310	B3	3326	A4		
2311	A2	3327	A5		
2312	A2	3328	A5		
2313	A2	3329	A5		
2314	A1	3330	A5		
2315	A2	3331	A1		
2316	A1	3332	A1		
3301	B4	3333	A1		
3302	B4	3334	A1		
3303	A4	3335	B1		
3304	A4	3336	A1		
3305	A4	4310	A2		
3306	A4	4311	B1		
3307	A4	4312	B2		
3308	A3	4313	A2		
3312	B1	4314	A2		
3313	B1	4315	A2		
3314	B3	4316	B4		
3315	B3	5300	B5		
3316	B3	5301	B5		

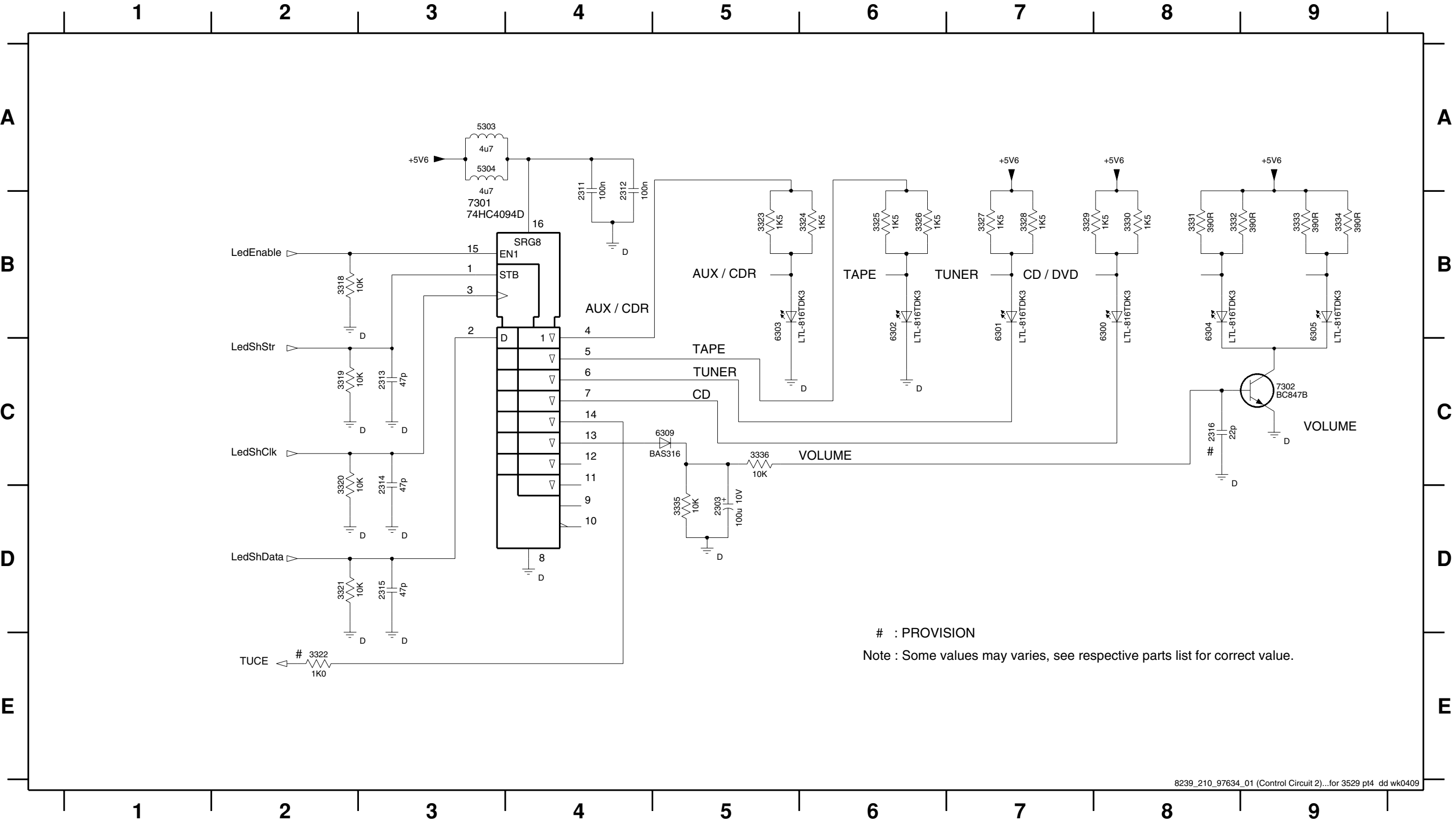


CONTROL BOARD - CIRCUIT DIAGRAM PART 1

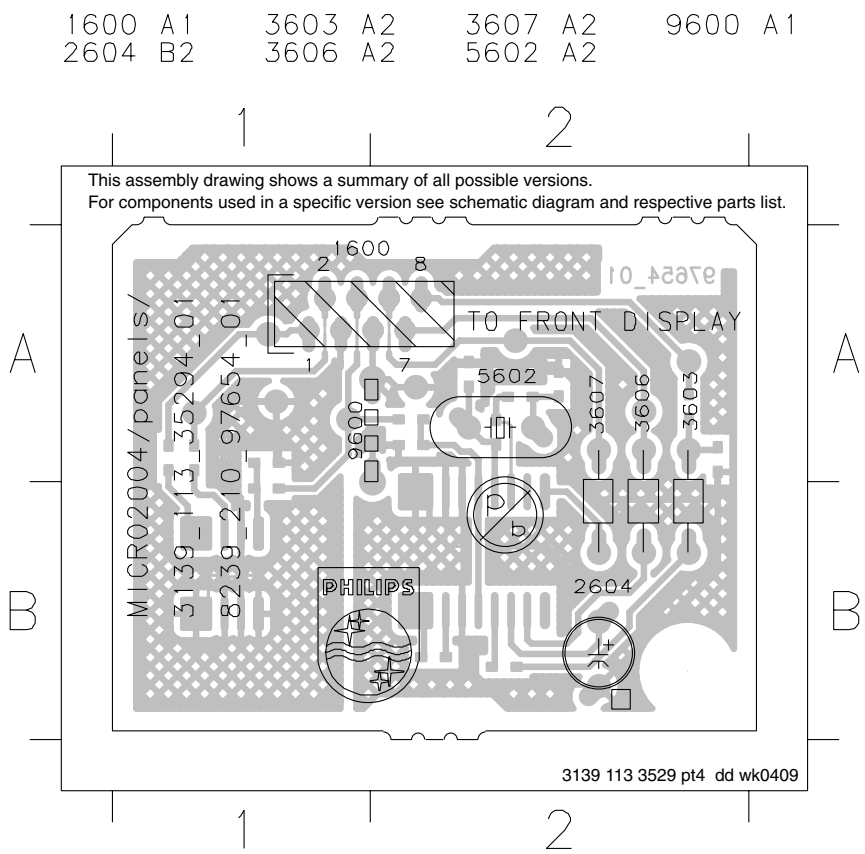


CONTROL BOARD - CIRCUIT DIAGRAM PART 2

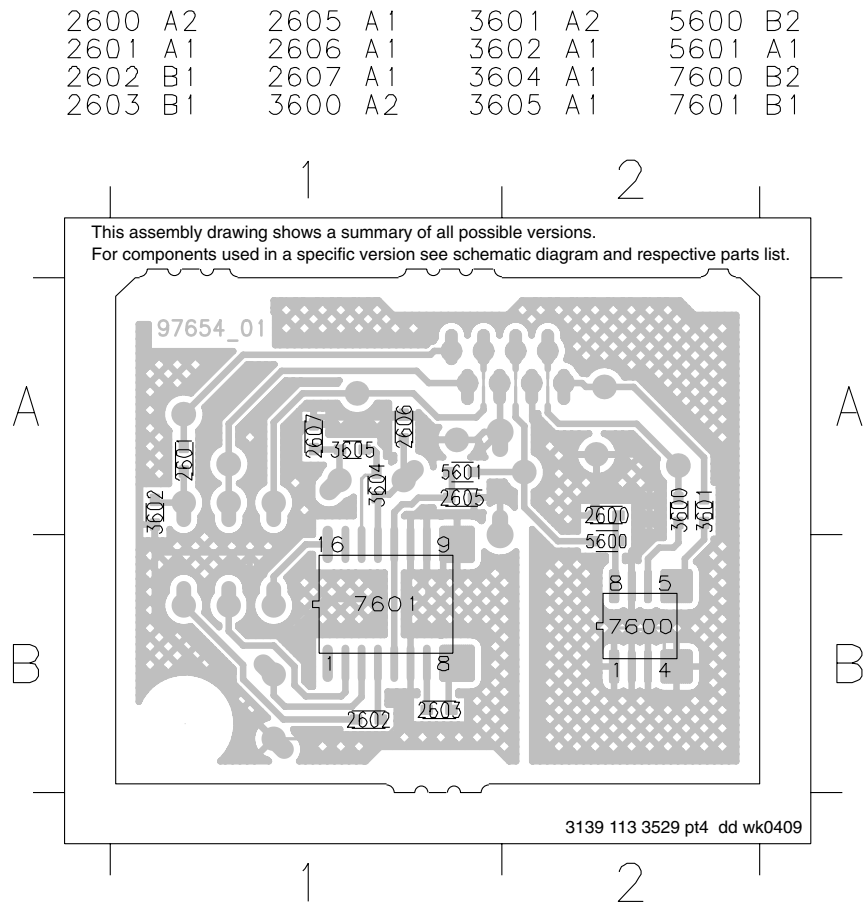
2303 D5    2312 A4    2314 C3    2316 C8    3319 C2    3321 D2    3323 B5    3325 B6    3327 B7    3329 B7    3331 B8    3333 B9    3335 D5    5303 A3    6300 B8    6302 B6    6304 B8    6309 C5    7302 C9  
2311 A4    2313 C3    2315 D3    3318 B2    3320 C2    3322 E2    3324 B6    3326 B6    3328 B7    3330 B8    3332 B8    3334 B9    3336 C5    5304 A3    6301 B7    6303 B5    6305 B9    7301 B3



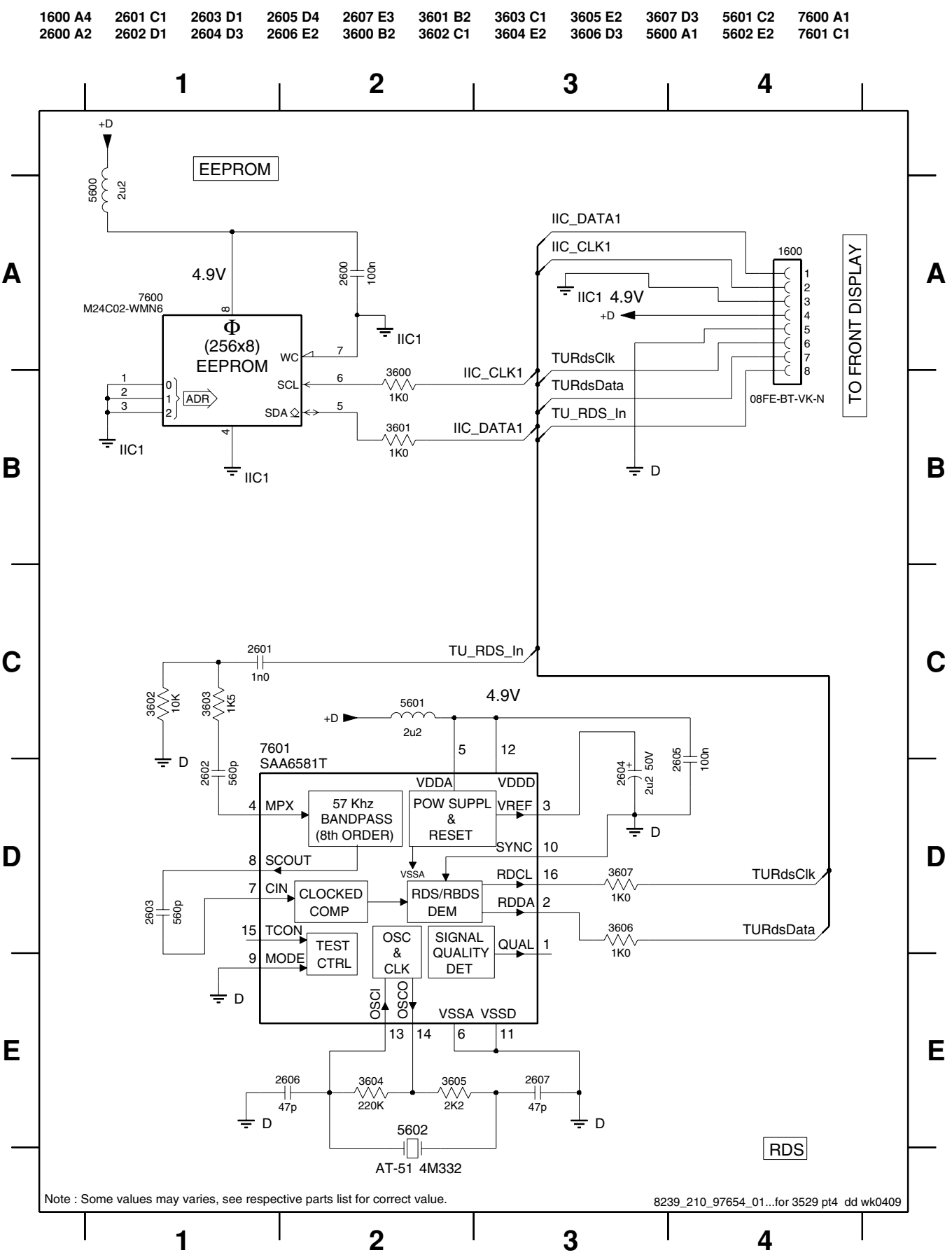
EEPROM BOARD - COMPONENT LAYOUT



EEPROM BOARD - CHIP LAYOUT

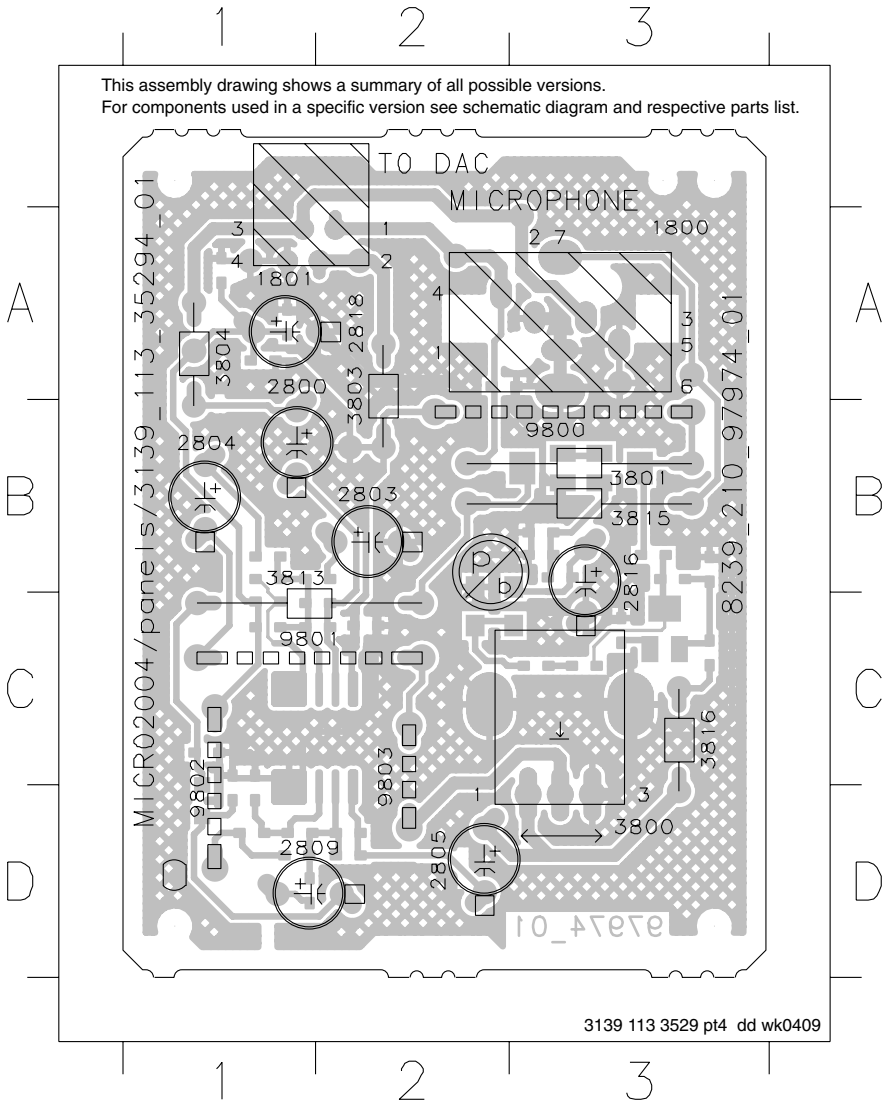


EEPROM BOARD - CIRCUIT DIAGRAM



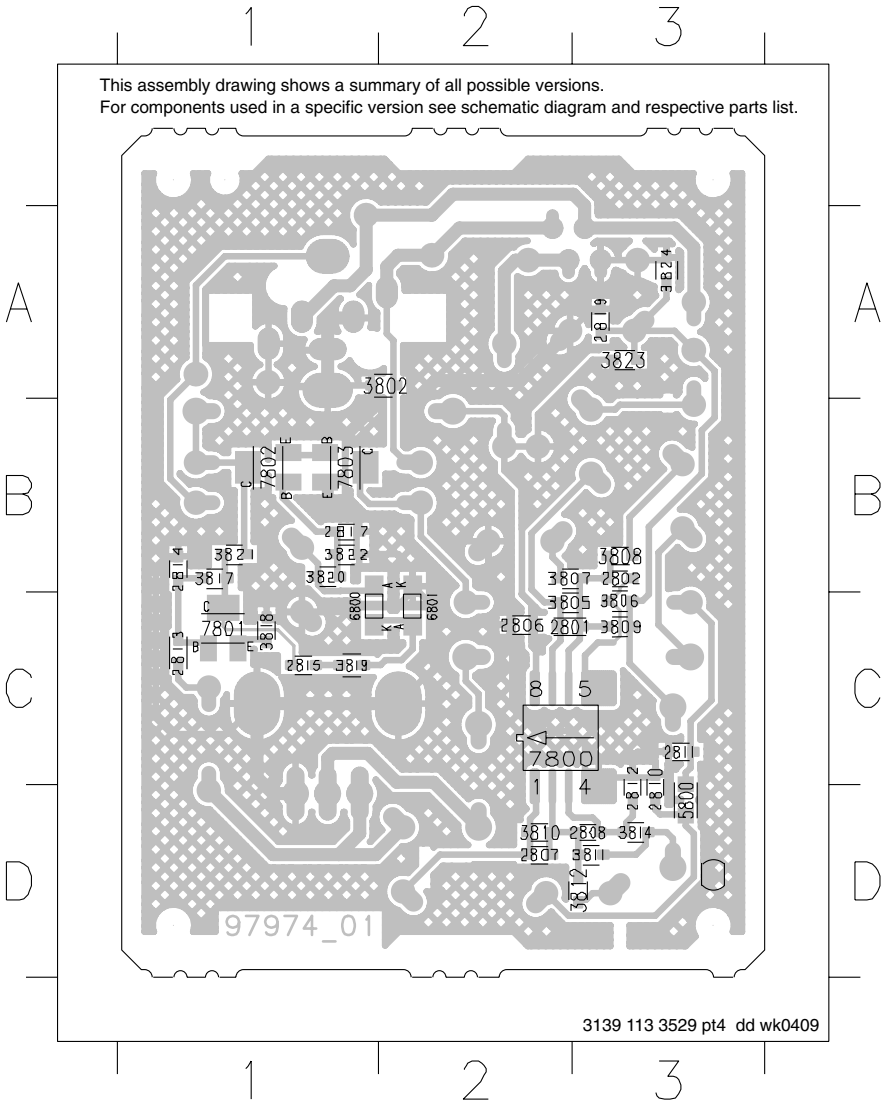
KARAOKE BOARD - COMPONENT LAYOUT (For MCD9 only)

1800 A3	2805 D2	3801 B3	3816 C3
1801 A1	2809 D1	3803 A2	9800 B3
2800 A1	2816 B3	3804 A1	9801 C1
2803 B2	2818 A2	3813 B1	9802 D1
2804 B1	3800 D3	3815 B3	9803 C2



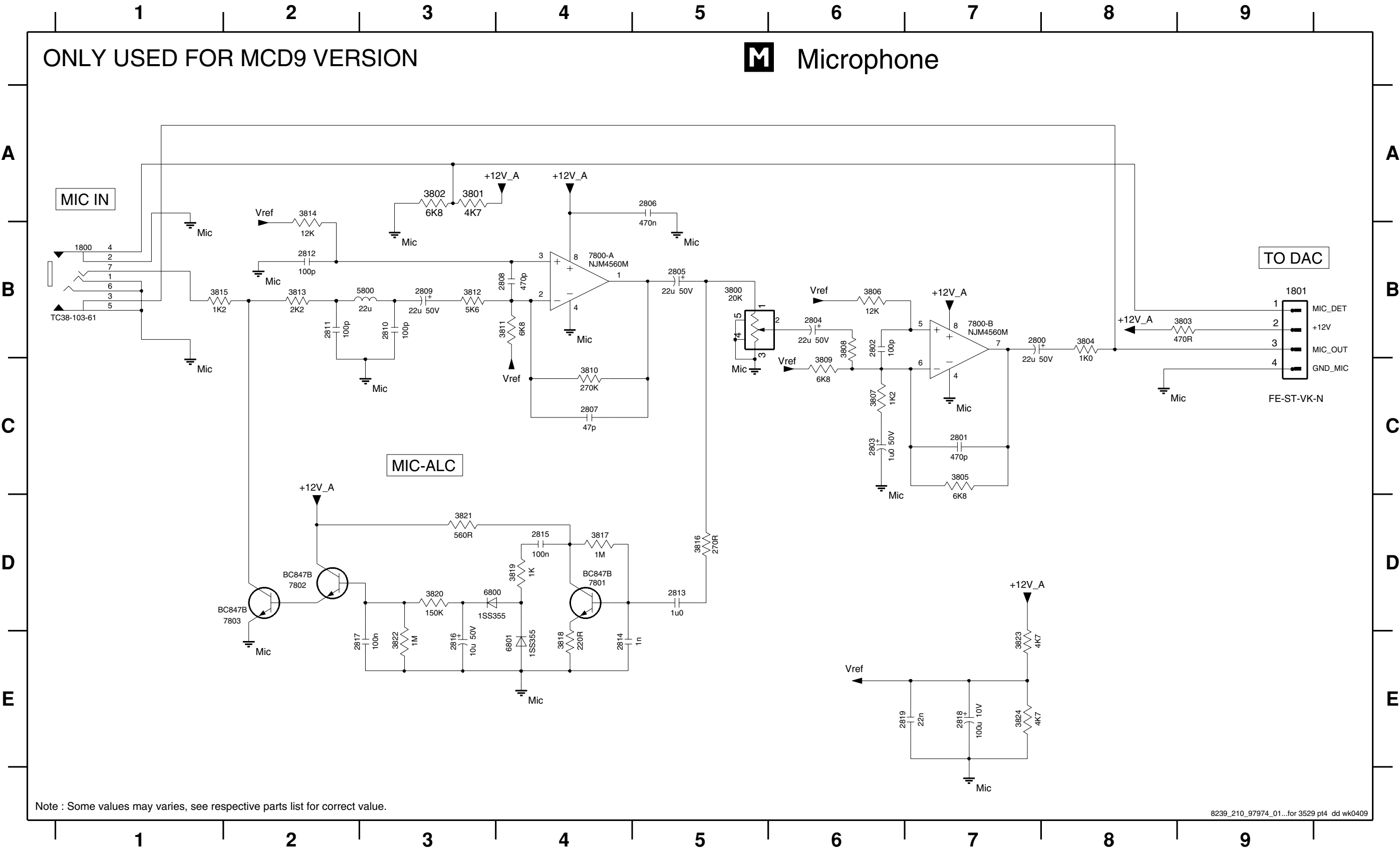
KARAOKE BOARD - CHIP LAYOUT (For MCD9 only)

2801 C2	2815 C1	3811 D3	3824 A3
2802 B3	2817 B1	3812 D3	5800 D3
2806 C2	2819 A3	3814 D3	6800 C1
2807 D2	3802 A2	3817 B1	6801 C2
2808 D3	3805 C2	3818 C1	7800 C2
2810 D3	3806 C3	3819 C1	7801 C1
2811 C3	3807 B2	3820 B1	7802 B1
2812 D3	3808 B3	3821 B1	7803 B1
2813 C1	3809 C3	3822 B1	
2814 B1	3810 D2	3823 A3	



KARAOKE BOARD - CIRCUIT DIAGRAM (For MCD9 only)

1800 B1	2801 C7	2804 B6	2807 C4	2810 B3	2813 D5	2816 E3	2819 E6	3802 A3	3805 C7	3808 B6	3811 B4	3814 A2	3817 D4	3820 D3	3823 E7	6800 D3	7800-B B7	7803 D2
1801 B9	2802 B6	2805 B5	2808 B4	2811 B2	2814 E4	2817 E2	3800 B5	3803 B9	3806 B6	3809 C6	3812 B3	3815 B1	3818 E4	3821 D3	3824 E7	6801 E4	7801 D4	
2800 B7	2803 C6	2806 A5	2809 B3	2812 B2	2815 D4	2818 E7	3801 A3	3804 B8	3807 C6	3810 C4	3813 B2	3816 D5	3819 D4	3822 E3	5800 B3	7800-A B4	7802 D2	



ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1300	4822 265 11183	Flex Connector 4P
1301	2422 026 05563	Headphone Socket
1302	4822 265 10979	Flex Connector 15P
1303	4822 276 13775	Tact Switch
1304	4822 276 13775	Tact Switch
1305	4822 276 13775	Tact Switch
1306	4822 276 13775	Tact Switch
1307	4822 276 13775	Tact Switch
1308	4822 276 13775	Tact Switch
1309	4822 276 13775	Tact Switch
1310	4822 276 13775	Tact Switch
1311	4822 276 13775	Tact Switch
1312	2422 129 16708	Rotary Encoder 24P
1313	2422 129 00039	Rotary Encoder 24P
1314	2422 129 00039	Rotary Encoder 24P
1331	4822 276 13775	Tact Switch
1332	4822 276 13775	Tact Switch
1333	4822 276 13775	Tact Switch
1334	4822 276 13775	Tact Switch
1400	3139 110 53601	FTD HNA-13SM42
1401	4822 265 11545	Flex Connector 19P
1402	4822 265 11531	Flex Connector 9P
1405	4822 265 10979	Flex Connector 15P
1406	4822 265 11535	Flex Connector 8P
1407	4822 267 10956	Flex Connector 7P
1600	4822 265 11515	Flex Connector 8P

CAPACITORS

2300	2238 586 59812	100nF +80/-20% 50V
2301	2238 916 15641	22nF 10% 25V
2302	2238 916 15641	22nF 10% 25V
2303	9965 000 14169	100uF 10V 20%
2305	5322 126 11583	10nF 10% 50V
2306	5322 126 11583	10nF 10% 50V
2307	5322 126 11583	10nF 10% 50V
2308	5322 126 11583	10nF 10% 50V
2309	5322 126 11583	10nF 10% 50V
2310	5322 126 11583	10nF 10% 50V
2311	2238 586 59812	100nF +80/-20% 50V
2312	2238 586 59812	100nF +80/-20% 50V
2313	4822 126 11785	47pF 5% 50V
2314	4822 126 11785	47pF 5% 50V
2315	4822 126 11785	47pF 5% 50V
2401	3198 017 44740	470nF 10V
2402	5322 126 11583	10nF 10% 50V
2403	5322 126 11583	10nF 10% 50V
2404	3198 028 52290	22uF 20% 50V
2405	3198 028 52290	22uF 20% 50V
2407	2222 867 15339	33pF 5% 50V
2408	4822 122 33761	22pF 5% 50V
2409	4822 126 14223	2,2pF 50V
2410	4822 122 33761	22pF 5% 50V

2411	4822 122 33761	22pF 5% 50V
2412	2020 552 94427	100pF 5% 50V
2413	2020 552 94427	100pF 5% 50V
2414	2020 552 94427	100pF 5% 50V
2417	2020 552 94427	100pF 5% 50V
2418	2020 552 94427	100pF 5% 50V
2419	2020 552 94427	100pF 5% 50V
2420	2020 552 94427	100pF 5% 50V
2444	2238 586 59812	100nF +80/-20% 50V
2450	4822 124 81286	47uF 20% 16V
2451	2238 586 59812	100nF +80/-20% 50V
2453	4822 124 81286	47uF 20% 16V
2457	4822 124 81286	47uF 20% 16V
2460	2020 552 94427	100pF 5% 50V
2461	4822 124 12032	4,7uF 20% 50V
2462	4822 124 12032	4,7uF 20% 50V
2463	4822 124 12032	4,7uF 20% 50V
2464	4822 124 12032	4,7uF 20% 50V
2473	4822 124 12032	4,7uF 20% 50V
2474	4822 126 14238	2,2nF 50V
2480	2020 552 94427	100pF 5% 50V
2600	2238 586 59812	100nF +80/-20% 50V
2601	5322 126 11578	1nF 10% 50V /22
2602	4822 126 14249	560pF 10% 50V /22
2603	4822 126 14249	560pF 10% 50V /22
2604	4822 124 22652	2,2uF 20% 50V /22
2605	2238 586 59812	100nF +80/-20% 50V/22
2606	4822 126 11785	47pF 5% 50V /22
2607	4822 126 11785	47pF 5% 50V /22

RESISTORS

3301	4822 051 30151	150R 5% 0,062W
3302	4822 051 30221	220R 5% 0,062W
3303	4822 051 30271	270R 5% 0,062W
3304	4822 051 30391	390R 5% 0,062W
3305	4822 051 30561	560R 5% 0,062W
3306	4822 117 12968	820R 5% 0,62W
3307	4822 117 11817	1k2 1% 1/16W
3308	4822 117 12903	1k8 1% 0,063W
3312	4822 051 30103	10k 5% 0,062W
3313	4822 051 30103	10k 5% 0,062W
3314	4822 051 30103	10k 5% 0,062W
3315	4822 051 30103	10k 5% 0,062W
3316	4822 051 30103	10k 5% 0,062W
3317	4822 051 30103	10k 5% 0,062W
3318	4822 051 30103	10k 5% 0,062W
3319	4822 051 30103	10k 5% 0,062W
3320	4822 051 30103	10k 5% 0,062W
3321	4822 051 30103	10k 5% 0,062W
3323	4822 051 30152	1k5 5% 0,062W
3324	4822 051 30152	1k5 5% 0,062W
3325	4822 051 30152	1k5 5% 0,062W

ELECTRICAL PARTS LIST - FRONT BOARD

3326	4822 051 30152	1k5 5% 0,062W
3327	4822 051 30152	1k5 5% 0,062W
3328	4822 051 30152	1k5 5% 0,062W
3329	4822 051 30152	1k5 5% 0,062W
3330	4822 051 30152	1k5 5% 0,062W
3331	4822 051 30391	390R 5% 0,062W
3332	4822 051 30391	390R 5% 0,062W
3333	4822 051 30391	390R 5% 0,062W
3334	4822 051 30391	390R 5% 0,062W
3335	4822 051 30103	10k 5% 0,062W
3336	4822 051 30103	10k 5% 0,062W
3350	4822 051 30151	150R 5% 0,062W
3351	4822 051 30221	220R 5% 0,062W
3352	4822 051 30271	270R 5% 0,062W
3400	4822 117 12968	820R 5% 0,62W
3401	4822 117 12925	47k 1% 0,063W
3403	4822 117 13632	100k 1% 0,62W
3404	4822 051 30684	680k 5% 0,062W
3405	4822 051 30102	1k 5% 0,062W
3406	4822 117 12891	220k 1%
3407	4822 051 30102	1k 5% 0,062W
3408	4822 051 30102	1k 5% 0,062W
3409	4822 051 30102	1k 5% 0,062W
3410	4822 051 30102	1k 5% 0,062W
3411	4822 051 30102	1k 5% 0,062W
3412	4822 051 30102	1k 5% 0,062W
3413	4822 051 30103	10k 5% 0,062W
3414	4822 051 30103	10k 5% 0,062W
3415	4822 051 30102	1k 5% 0,062W
3416	4822 051 30102	1k 5% 0,062W
3417	4822 051 30102	1k 5% 0,062W
3418	4822 051 30102	1k 5% 0,062W
3419	4822 051 30102	1k 5% 0,062W
3420	4822 050 21003	10k 1% 0,6W
3421	4822 051 30103	10k 5% 0,062W
3422	4822 051 30102	1k 5% 0,062W
3423	4822 051 30102	1k 5% 0,062W
3424	4822 051 30102	1k 5% 0,062W
3425	4822 051 30102	1k 5% 0,062W
3426	4822 051 30102	1k 5% 0,062W
3427	4822 051 30102	1k 5% 0,062W
3428	4822 051 30102	1k 5% 0,062W
3431	4822 051 30102	1k 5% 0,062W
3432	4822 051 30472	4k7 5% 0,062W
3433	4822 116 52263	2k7 5% 0,5W
3434	4822 116 52213	180R 5% 0,5W
3435	4822 051 30102	1k 5% 0,062W /22
3436	4822 051 30105	1M 5% 0,062W
3437	4822 051 30684	680k 5% 0,062W
3438	4822 051 30105	1M 5% 0,062W
3439	4822 051 30102	1k 5% 0,062W
3440	4822 051 30102	1k 5% 0,062W

3441	4822 051 30102	1k 5% 0,062W
3442	4822 051 30101	100R 5% 0,062W
3443	4822 051 30101	100R 5% 0,062W
3444	4822 051 30102	1k 5% 0,062W
3445	4822 051 30102	1k 5% 0,062W
3446	4822 051 30471	470R 5% 0,062W
3447	4822 051 30471	470R 5% 0,062W
3448	4822 051 30471	470R 5% 0,062W
3452	4822 051 30471	470R 5% 0,062W
3453	4822 051 30102	1k 5% 0,062W
3454	4822 051 30102	1k 5% 0,062W
3455	4822 051 30102	1k 5% 0,062W
3456	4822 051 30102	1k 5% 0,062W
3457	4822 051 30102	1k 5% 0,062W
3458	4822 051 30102	1k 5% 0,062W
3459	4822 051 30102	1k 5% 0,062W
3460	4822 051 30102	1k 5% 0,062W
3461	4822 051 30102	1k 5% 0,062W
3462	4822 051 30102	1k 5% 0,062W
3463	4822 051 30471	470R 5% 0,062W
3464	4822 051 30471	470R 5% 0,062W
3465	4822 051 30272	2k7 5% 0,062W
3466	4822 051 30102	1k 5% 0,062W
3467	4822 051 30102	1k 5% 0,062W
3468	4822 051 30102	1k 5% 0,062W
3469	4822 051 30102	1k 5% 0,062W
3470	4822 051 30102	1k 5% 0,062W
3471	4822 051 30102	1k 5% 0,062W
3472	4822 051 30102	1k 5% 0,062W
3473	4822 051 30102	1k 5% 0,062W
3474	4822 051 30102	1k 5% 0,062W
3475	4822 051 30102	1k 5% 0,062W
3476	4822 051 30102	1k 5% 0,062W
3477	4822 051 30102	1k 5% 0,062W
3478	4822 051 30102	1k 5% 0,062W
3479	4822 051 30102	1k 5% 0,062W
3480	4822 051 30102	1k 5% 0,062W
3481	4822 051 30102	1k 5% 0,062W
3482	4822 051 30102	1k 5% 0,062W
3483	4822 051 30102	1k 5% 0,062W
3484	4822 051 30102	1k 5% 0,062W
3485	4822 051 30102	1k 5% 0,062W
3486	4822 051 30102	1k 5% 0,062W
3487	4822 051 30102	1k 5% 0,062W
3488	4822 051 30102	1k 5% 0,062W
3489	4822 051 30102	1k 5% 0,062W
3490	4822 117 12864	82k 5% 0,6W
3491	4822 051 30103	10k 5% 0,062W /37
3492	4822 117 12864	82k 5% 0,6W
3493	4822 117 12864	82k 5% 0,6W
3494	4822 051 30682	6k8 5% 0,062W
3495	4822 051 30682	6k8 5% 0,062W

**ELECTRICAL PARTS LIST - FRONT BOARD****RESISTORS**

3496	4822 051 30103	10k 5% 0,062W	/37
3497	4822 050 21003	10k 1% 0,6W	/37
3498	4822 051 30101	100R 5% 0,062W	
3499	4822 051 30101	100R 5% 0,062W	
3500	4822 051 30221	220R 5% 0,062W	
3501	4822 051 30221	220R 5% 0,062W	
3502	4822 051 30471	470R 5% 0,062W	
3508	4822 051 30393	39k 5% 0,062W	
3509	4822 051 30103	10k 5% 0,062W	
3510	4822 051 30103	10k 5% 0,062W	
3511	4822 051 30103	10k 5% 0,062W	
3513	4822 051 30102	1k 5% 0,062W	
3514	4822 051 30102	1k 5% 0,062W	
3515	4822 051 30102	1k 5% 0,062W	
3518	4822 116 83872	220R 5% 0,5W	
3519	4822 116 81154	2R2 5% 0,5W	
3520	4822 116 81154	2R2 5% 0,5W	
3521	4822 116 52257	22k 5% 0,5W	
3522	4822 116 83872	220R 5% 0,5W	
3523	4822 116 81154	2R2 5% 0,5W	
3524	4822 116 81154	2R2 5% 0,5W	
3527	4822 051 30101	100R 5% 0,062W	
3529	4822 051 30101	100R 5% 0,062W	
3531	4822 051 30101	100R 5% 0,062W	
3532	4822 051 30101	100R 5% 0,062W	
3533	4822 051 30103	10k 5% 0,062W	
3534	4822 051 30102	1k 5% 0,062W	
3535	4822 116 52263	2k7 5% 0,5W	
3600	4822 051 30102	1k 5% 0,062W	
3601	4822 051 30102	1k 5% 0,062W	
3602	4822 051 30103	10k 5% 0,062W	/22
3603	4822 116 52243	1k5 5% 0,5W	/22
3604	4822 117 12891	220k 1%	/22
3605	4822 051 30222	2k2 5% 0,062W	/22
3606	4822 050 11002	1k 1% 0,4W	/22
3607	4822 050 11002	1k 1% 0,4W	/22
4300	4822 051 30008	OR Jumper 0603	
4301	4822 051 30008	OR Jumper 0603	
4302	4822 051 30008	OR Jumper 0603	
4303	4822 051 30008	OR Jumper 0603	
4310	4822 051 30008	OR Jumper 0603	
4311	4822 051 30008	OR Jumper 0603	
4312	4822 051 30008	OR Jumper 0603	
4313	4822 051 30008	OR Jumper 0603	
4314	4822 051 30008	OR Jumper 0603	
4315	4822 051 30008	OR Jumper 0603	
4316	4822 051 30008	OR Jumper 0603	
4404	4822 051 30008	OR Jumper 0603	
4405	4822 051 30008	OR Jumper 0603	
4406	4822 051 30008	OR Jumper 0603	
4407	4822 051 30008	OR Jumper 0603	
4409	4822 051 30008	OR Jumper 0603	

**COILS & FILTERS**

5300	3198 018 52280	FXDIND SM 0603 2U2 10%
5301	3198 018 52280	FXDIND SM 0603 2U2 10%
5302	3198 018 52280	FXDIND SM 0603 2U2 10%
5303	3198 018 54780	FXDIND SM 0603 4U7 10%
5304	3198 018 54780	FXDIND SM 0603 4U7 10%
5400	5322 242 73686	RES CER 12MHz
5401	2422 543 01069	RES XTL 32,768kHz
5402	3198 018 54780	FXDIND SM 0603 4U7 10%
5403	3198 018 54780	FXDIND SM 0603 4U7 10%
5404	4822 157 62552	Coil 2,2uH 5%
5405	4822 157 62552	Coil 2,2uH 5%
5406	4822 157 62552	Coil 2,2uH 5%
5407	4822 157 62552	Coil 2,2uH 5%
5600	3198 018 52280	FXDIND SM 0603 2U2 10%
5601	3198 018 52280	FXDIND SM 0603 2U2 10%/22

**ELECTRICAL PARTS LIST - FRONT BOARD**

5602	4822 242 11033	RES XTL 4,332MHz /22
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**DIODES**

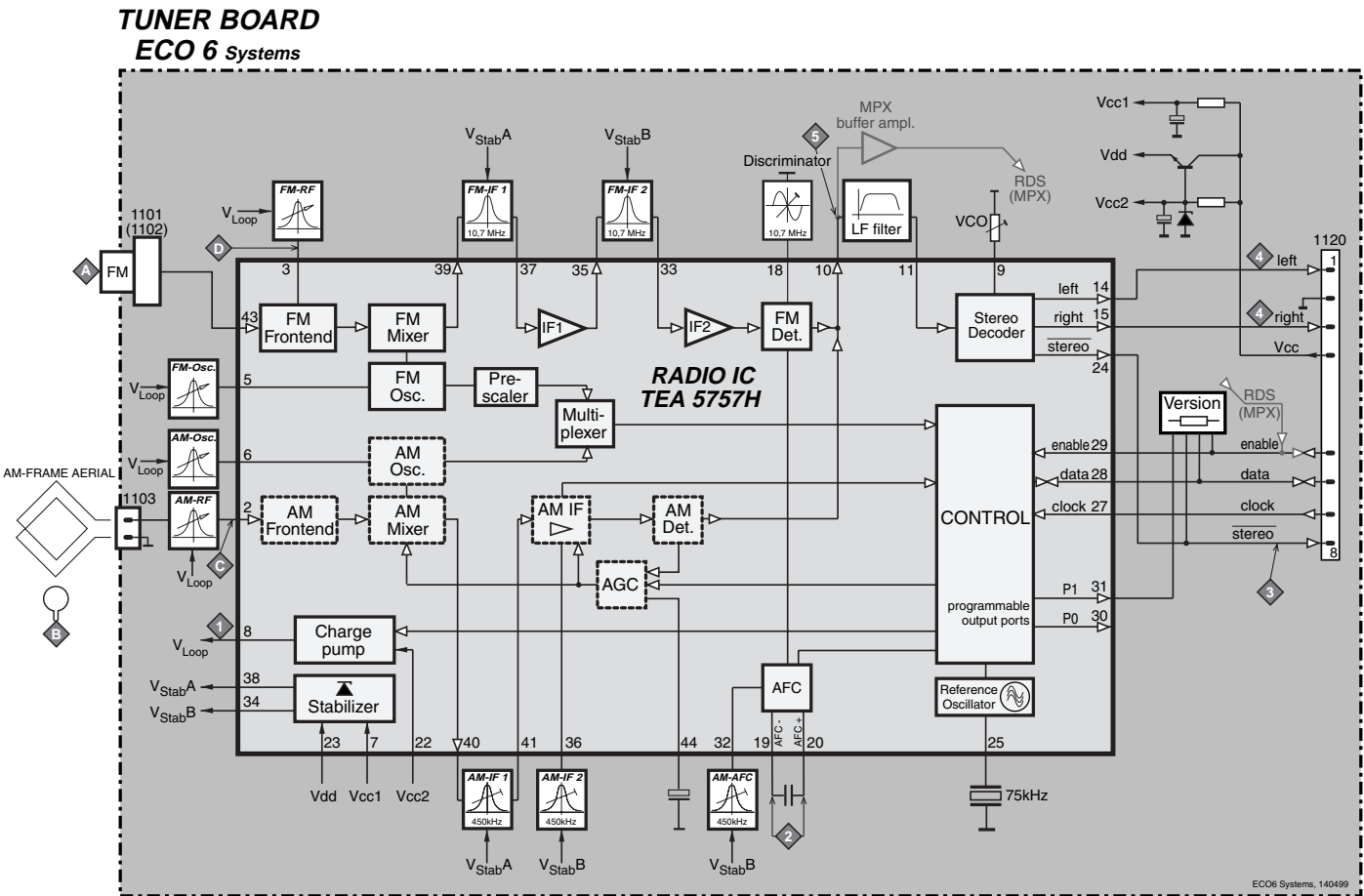
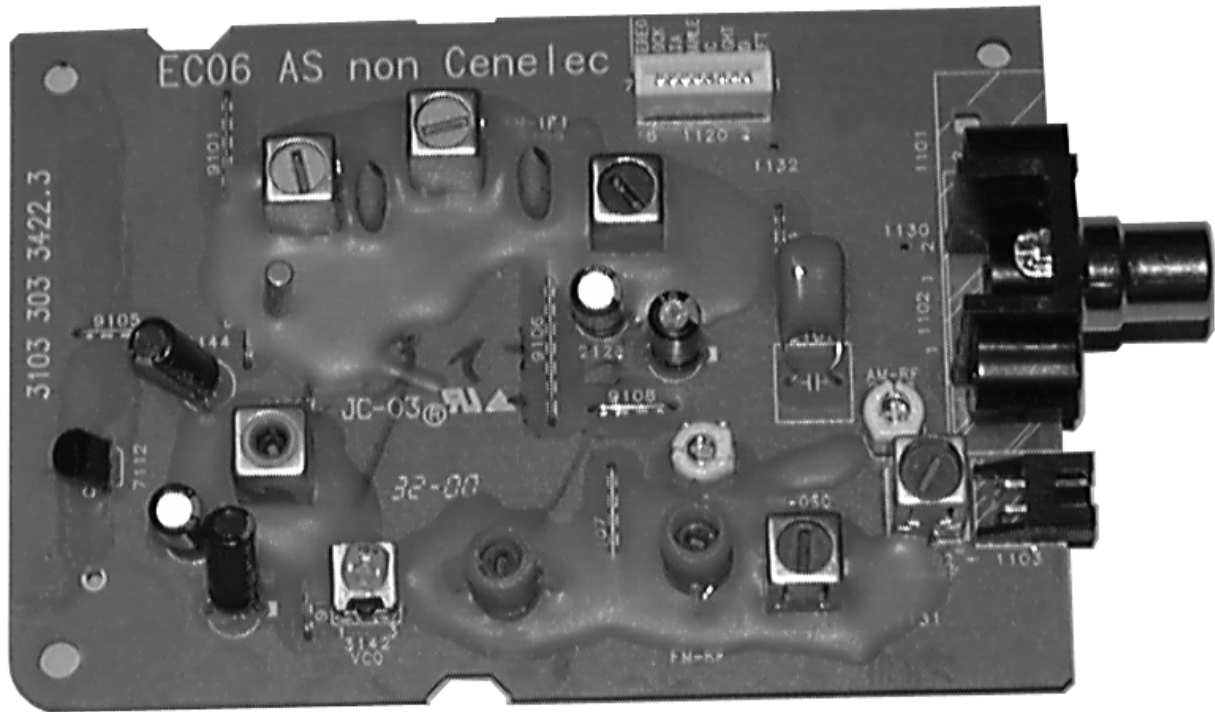
6300	9322 190 55676	LED VS LTL-816TDK3
6301	9322 190 55676	LED VS LTL-816TDK3
6302	9322 190 55676	LED VS LTL-816TDK3
6303	9322 190 55676	LED VS LTL-816TDK3
6304	9322 190 55676	LED VS LTL-816TDK3
6305	9322 190 55676	LED VS LTL-816TDK3
6306	9322 179 76676	LED VS LTL-816EELC
6308	4822 130 31878	1N4003G
6309	4822 130 11397	BAS316
6400	4822 130 30621	1N4148
6401	4822 130 30621	1N4148
6402	4822 130 30621	1N4148
6403	4822 130 30621	1N4148
6404	4822 130 30621	1N4148
6405	4822 130 31878	1N4003G
6406	4822 130 31878	1N4003G
6407	4822 130 31878	1N4003G
6408	4822 130 30621	1N4148
6409	4822 130 34278	BZX79-B6V8
6410	4822 130 30621	1N4148

**TRANSISTORS & INTEGRATED CIRCUITS**

7301	4822 209 15449	IC SM 74HC4094D
7302	5322 130 60159	BC847B
7400	3139 110 53741	TMP88CU74YF - 'MCM7/8S53741'
7401	4822 130 60373	BC857B
7402	5322 130 60159	BC847B
7403	9322 185 95667	IR Receiver TSOP4836ZC1
7404	5322 130 60159	BC847B
7405	5322 130 60159	BC847B
7407	5322 130 60159	BC847B
7408	5322 130 60159	BC847B
7600	9322 145 26668	IC SM M24C02-WMN6
7601	9352 686 05118	IC SM SAA6581T /22

Note : Only the parts mentioned in this list are normal service spare parts.

BLOCK DIAGRAM



# ECO6 Tuner Board

version: **SYSTEMS non-CENELEC**

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Blockdiagram .....7A-1

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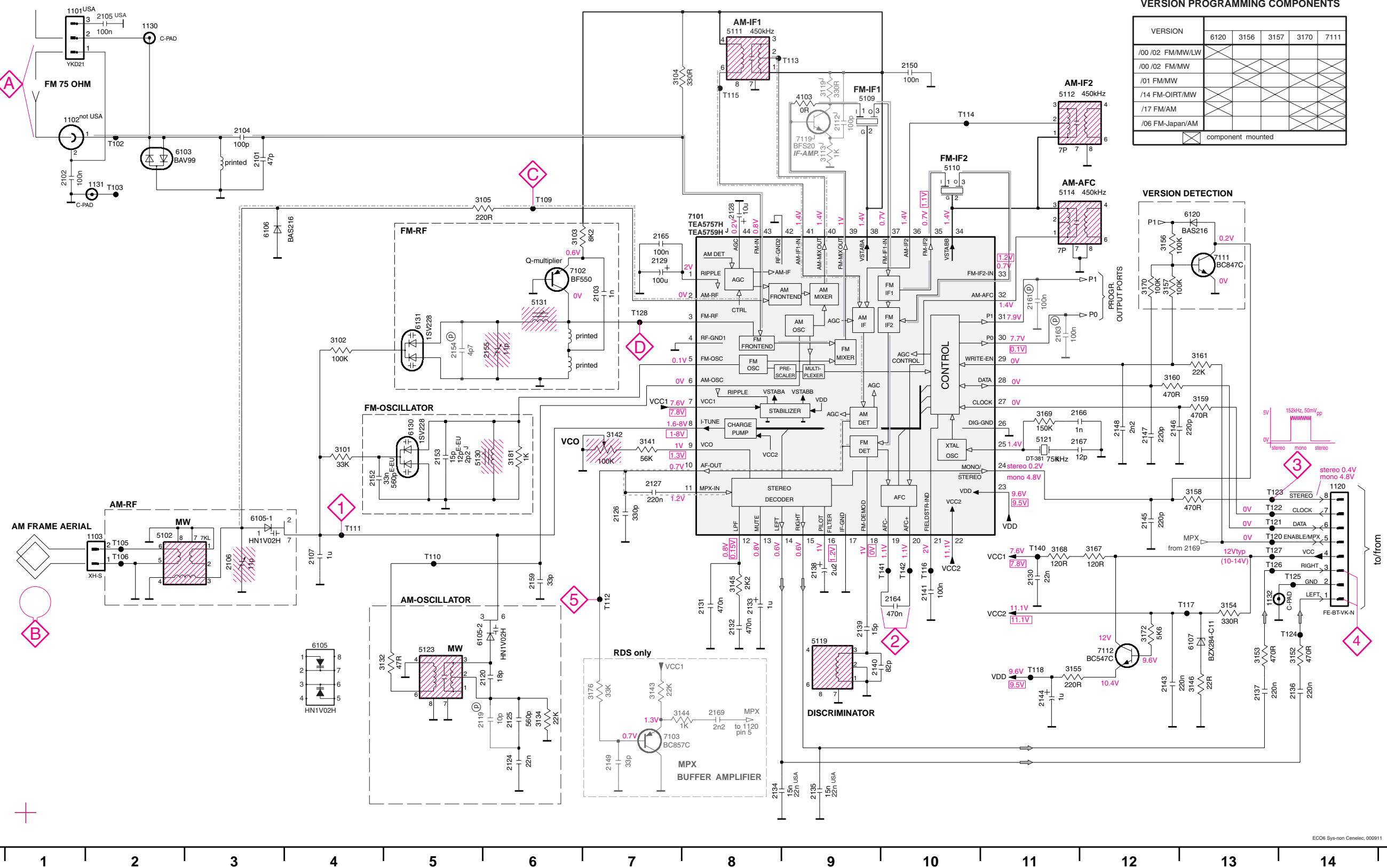
Component Layout.....7A-3

Adjustment table .....7A-3

Electrical Partslist.....7A-4

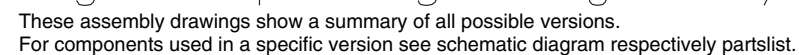
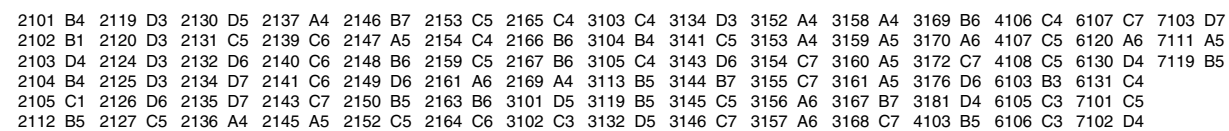


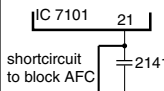

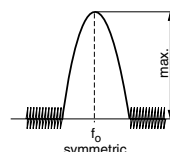
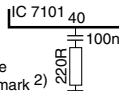

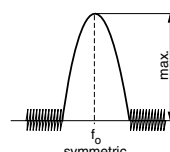
## TUNER BOARD ECO6 / SYSTEMS NON CENELEC



ECO6 Sys-non Cenelec, 000911

1101 A1  
 1102 B1  
 1103 F2  
 1120 E14  
 1130 A2  
 1131 B2  
 1132 G13  
 1101 B3  
 2102 B1  
 2103 C7  
 2104 B3  
 2105 A2  
 2106 F3  
 2107 F4  
 2119 H6  
 2120 G6  
 2124 H6  
 2125 H6  
 2126 F7  
 2127 E7  
 2128 C8  
 2129 C7  
 2130 F11  
 2131 G8  
 2132 G8  
 2133 G8  
 2134 H8  
 2135 H9  
 2136 G14  
 2137 G13  
 2138 F9  
 2139 G9  
 2140 G9  
 2141 F10  
 2143 G12  
 2144 G11  
 2145 F12  
 2146 E12  
 2147 E12  
 2148 H7  
 2150 A10  
 2152 E4  
 2153 E5  
 2154 D5  
 2155 D5  
 2159 F6  
 2161 C11  
 2163 D11  
 2164 F10  
 2165 C7  
 2166 E11  
 2167 E11  
 2169 H8  
 3101 E4  
 3102 D4  
 3103 C6  
 3104 A7  
 3105 B6  
 3132 G5  
 3134 H6  
 3141 E7  
 3142 E7  
 3143 G7  
 3144 H7  
 3145 F8  
 3146 G13  
 3152 G14  
 3153 G13  
 3154 G13  
 3155 G11  
 3156 C12  
 3157 C12  
 3158 F13  
 3159 D13  
 3160 D12  
 3161 D13  
 3167 F12  
 3168 F11  
 3169 E11  
 3170 C12  
 3172 G12  
 3176 G7  
 3181 E6  
 5102 F2  
 5109 B9  
 5110 B10  
 5111 A8  
 5112 A11  
 5114 B11  
 5119 G9  
 5121 E11  
 5123 G5  
 5130 E5  
 5131 C6  
 5132 B2  
 6105-1 F3  
 6105-2 G5  
 6106 C3  
 6107 G13  
 6120 C13  
 6130 E5  
 6131 D5  
 7101 C8  
 7102 C6  
 7103 H7  
 7111 C13  
 7112 G12  
 T102 B2  
 T103 B2  
 T105 F2  
 T106 F2  
 T109 B6  
 T110 F5  
 T111 F4  
 T112 F7  
 T113 A8  
 T114 B10  
 T115 A8  
 T116 F10  
 T117 G13  
 T118 G11  
 T120 F11  
 T121 F13  
 T122 F13  
 T123 E13  
 T124 G14  
 T125 F14  
 T126 F13  
 T127 F13  
 T128 D7  
 T140 F11  
 T141 F10  
 T142 F10



Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	<div>1</div>	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>LW</b>  153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>MW</b> FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
<b>FM</b>	10.7MHz, 45mV continuous wave	<div>D</div>		5119	<div>2</div>	0 ± 3 mV DC
FM RF						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	<div>A</div> mod=1kHz Δf=±22.5kHz	108MHz	2155	<div>4</div>	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
<b>FM</b>	98MHz, 1mV continuous wave	<div>A</div>	98MHz	3142	<div>3</div>	152kHz ±1kHz <sup>1)</sup>
AM IF						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	<div>C</div> Δf=±10kHz V <sub>RF</sub> = 0.5mV (as low as possible)		5111	<div>5</div>	
			 see remark 2)	5112		
<b>AM AFC</b> <b>MW</b>		<div>C</div> continuous wave V <sub>RF</sub> = 2mV		5114	<div>2</div>	0 ± 2 mV DC
AM RF <sup>3)</sup>						
<b>MW</b> <sup>4)</sup> FM/MW/LW- and FM/MW-version ( 9kHz grid) 531 - 1602kHz	1494kHz	<div>B</div> 	1494kHz	2106	<div>5</div>	
	558kHz		558kHz	5102		
<b>LW</b>	198kHz		198kHz	5103		
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used !

4) MW has to be aligned before LW.

Repeat

MISCELLANEOUS

1101	2422 015 19376	SOCKET 2P CLICKFIT	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR 2 POLE	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2101	4822 126 13692	47pF	1%	63V	
2102	4822 126 13838	100nF	10%	50V	not USA
2103	5322 122 31647	1nF	10%	63V	
2104	5322 122 32531	100pF	5%	50V	
2105	4822 126 13838	100nF	10%	50V	USA only

2106	2020 800 00191	3-11pF TRIMCAP.,N450		
2107	4822 121 51319	1μF	20%	50V
2120©	4822 126 13689	18pF	1%	63V
2124©	5322 122 32654	22nF	10%	63V
2125©	2020 552 96199	560pF	1%	50V

2126	5322 122 31863	330pF	5%	50V	
2127	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10μF	20%	63V	
2129	4822 124 41584	100μF	20%	10V	
2130	5322 122 32654	22nF	10%	63V	

2131	4822 126 13482	470nF	20%	16V	
2132	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1μF	20%	63V	
2134	4822 126 13188	15nF	5%	63V	not USA
2134	5322 122 32654	22nF	10%	63V	USA only

2135	4822 126 13188	15nF	5%	63V	not USA
2135	5322 122 32654	22nF	10%	63V	USA only
2136	4822 126 14076	220nF	20%	25V	
2137	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2μF	20%	50V	

2139	4822 126 14236	15pF	5%	50V	
2140	4822 126 13695	82pF	1%	63V	
2141	4822 126 13838	100nF	10%	50V	
2143	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1μF	20%	63V	

2145	4822 122 33575	220pF	5%	50V	
2146	4822 122 33575	220pF	5%	50V	
2147	4822 122 33575	220pF	5%	50V	
2148	4822 122 33127	2,2nF	10%	63V	
2149	5322 122 32659	33pF	5%	50V	RDS only

2150	4822 126 13838	100nF	10%	50V	
2152	4822 126 12105	33nF	5%	63V	not for East Europe
2152	5322 116 80853	560pF	5%	63V	for East Europe only
2153	4822 126 13486	15pF	2%	63V	not for East Europe
2153	4822 122 33926	12pF	2%	50V	for East Europe only

2155	2020 800 00191	3-11pF	TRIMCAP.,N450	
2159©	5322 122 32659	33pF	5%	50V
2164©	4822 126 13482	470nF	20%	16V
2165©	4822 126 13838	100nF	10%	50V
2166©	5322 122 31647	1nF	10%	63V

2167	4822 122 33926	12pF	5%	50V	
2169	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101	4822 051 20333	33kΩ	5%	0,1W	
3102	4822 117 10837	100kΩ	1%	0,1W	
3103	4822 051 20822	8,2kΩ	5%	0,1W	
3104	4822 117 13577	330Ω	1%	0,1W	
3105	4822 117 11503	220Ω	5%	0,1W	

3132	4822 051 20479	47Ω	5%	0,1W	
3134	4822 051 20223	22kΩ	5%	0,1W	
3141	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			

RESISTORS

3143	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145	4822 117 11449	2,2kΩ	1%	0,1W	
3146	4822 051 20229	22Ω	5%	0,1W	
3152	4822 051 20471	470Ω	5%	0,1W	

3153	4822 051 20471	470Ω	5%	0,1W	
3154	4822 117 13577	330Ω	1%	0,1W	
3155	4822 117 11503	220Ω	5%	0,1W	
3156	4822 117 10837	100kΩ	1%	0,1W	
3157	4822 117 10837	100kΩ	1%	0,1W	

3158	4822 051 20471	470Ω	5%	0,1W	
3159	4822 051 20471	470Ω	5%	0,1W	
3160	4822 051 20471	470Ω	5%	0,1W	
3161	4822 051 20223	22kΩ	5%	0,1W	
3167	4822 051 20121	120Ω	5%	0,1W	

3168	4822 051 20121	120Ω	5%	0,1W	
3169	4822 051 20154	150kΩ	5%	0,1W	
3170	4822 117 10837	100kΩ	1%	0,1W	
3172	4822 051 20562	5,6kΩ	5%	0,1W	
3176	4822 051 20333	33kΩ	5%	0,1W	RDS only

3181	4822 051 10102	1kΩ	2%	0,25W	
4103	4822 051 20008	CHIP JUMPER 0805			
4106	4822 051 20008	CHIP JUMPER 0805			
4107	4822 051 20008	CHIP JUMPER 0805			
4108	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW	
5109	4822 242 70665	FM-IF FILTER 10,7MHz	
5110	4822 242 70665	FM-IF FILTER 10,7MHz	
5111	2422 549 44023	AM-IF FILTER 450kHz	
5112	4822 157 70302	AM-IF FILTER 450kHz	

5114	4822 157 70302	AM-IF FILTER 450kHz	
5119	4822 157 11443	DISCRIMINATOR COIL	
5121	4822 242 10261	QUARTZ 75kHz	
5123	2422 549 44108	RF-COIL, AM-OSCILLATOR	
5130	4822 157 11843	RF COIL 1,5 TURNS	

5131	4822 157 11843	RF COIL 1,5 TURNS	
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DIODES

6103	5322 130 34337	BAV99	
6105	4822 130 83075	HN1V02H	
6106	4822 130 83757	BAS216	
6107	9340 386 90115	BZX284-C11	
6120	4822 130 83757	BAS216	

6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

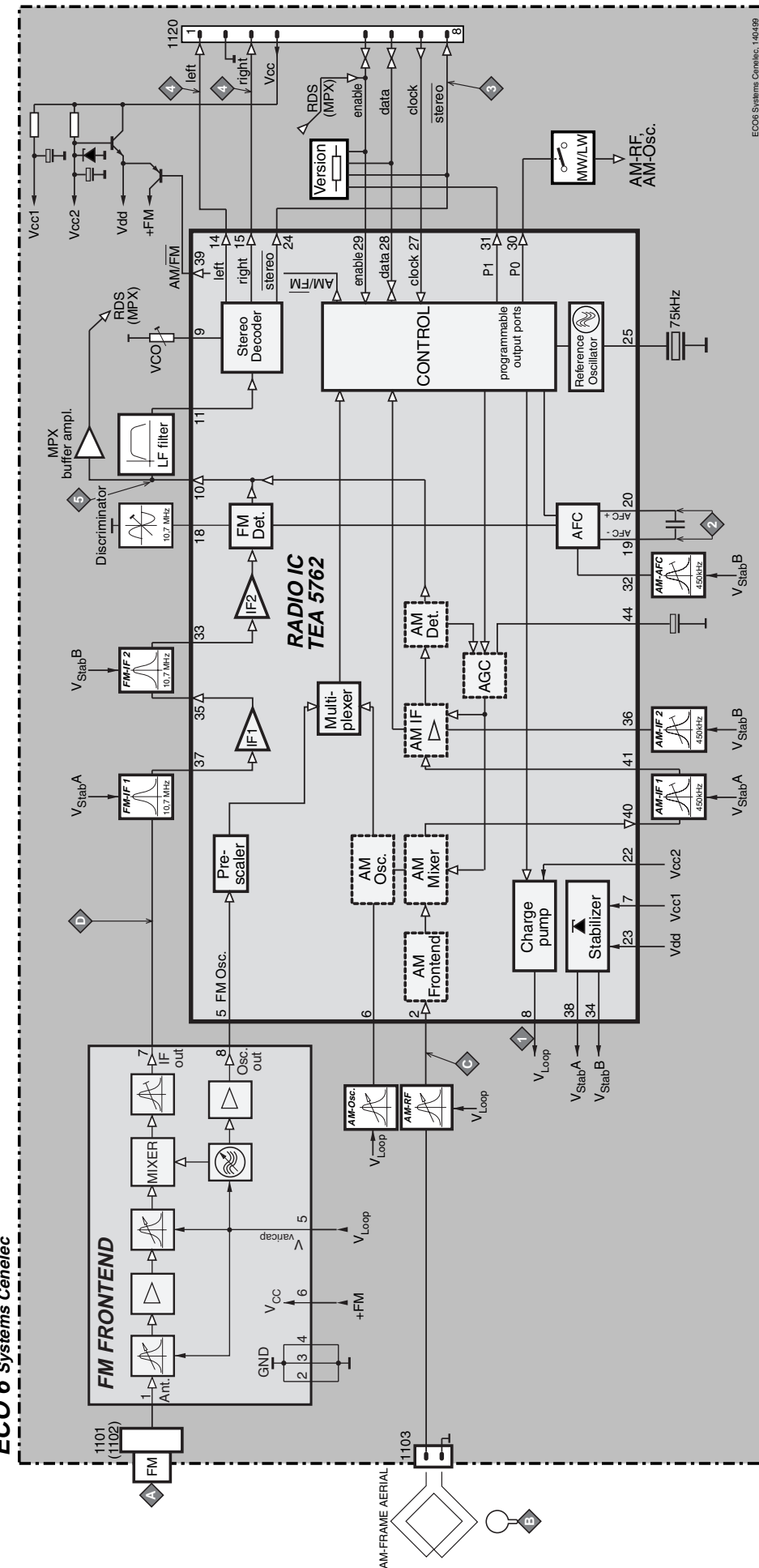
TRANSISTORS

7102	4822 130 42131	BF550	
7103	5322 130 42756	BC857C	RDS only
7111	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	

INTEGRATED CIRCUITS

7101	9351 740 80557	TEA5757H/V1, RADIO IC	
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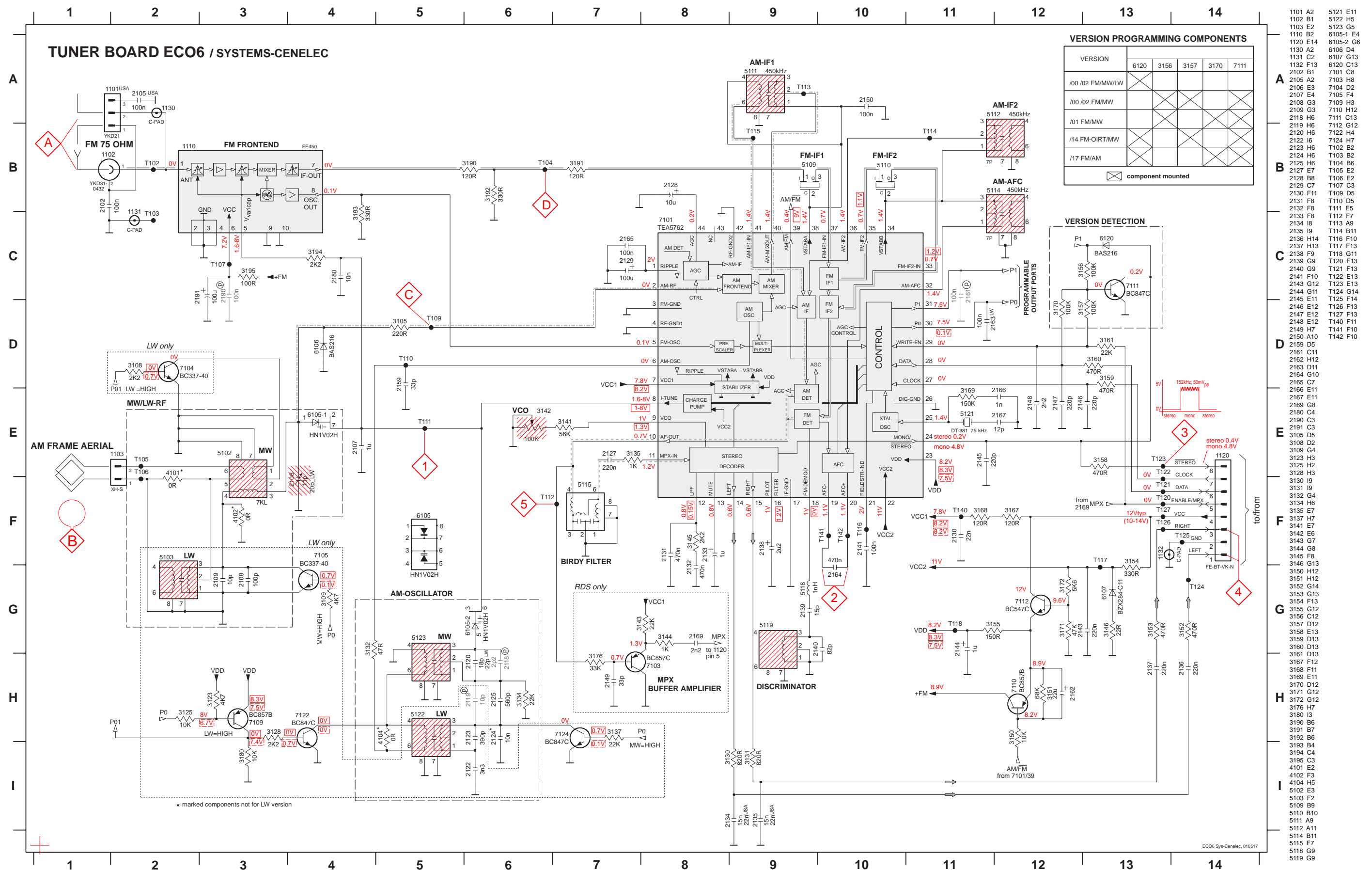
## TUNER BOARD ECO 6 Systems Cenelec



version: **SYSTEMS CENELEC**

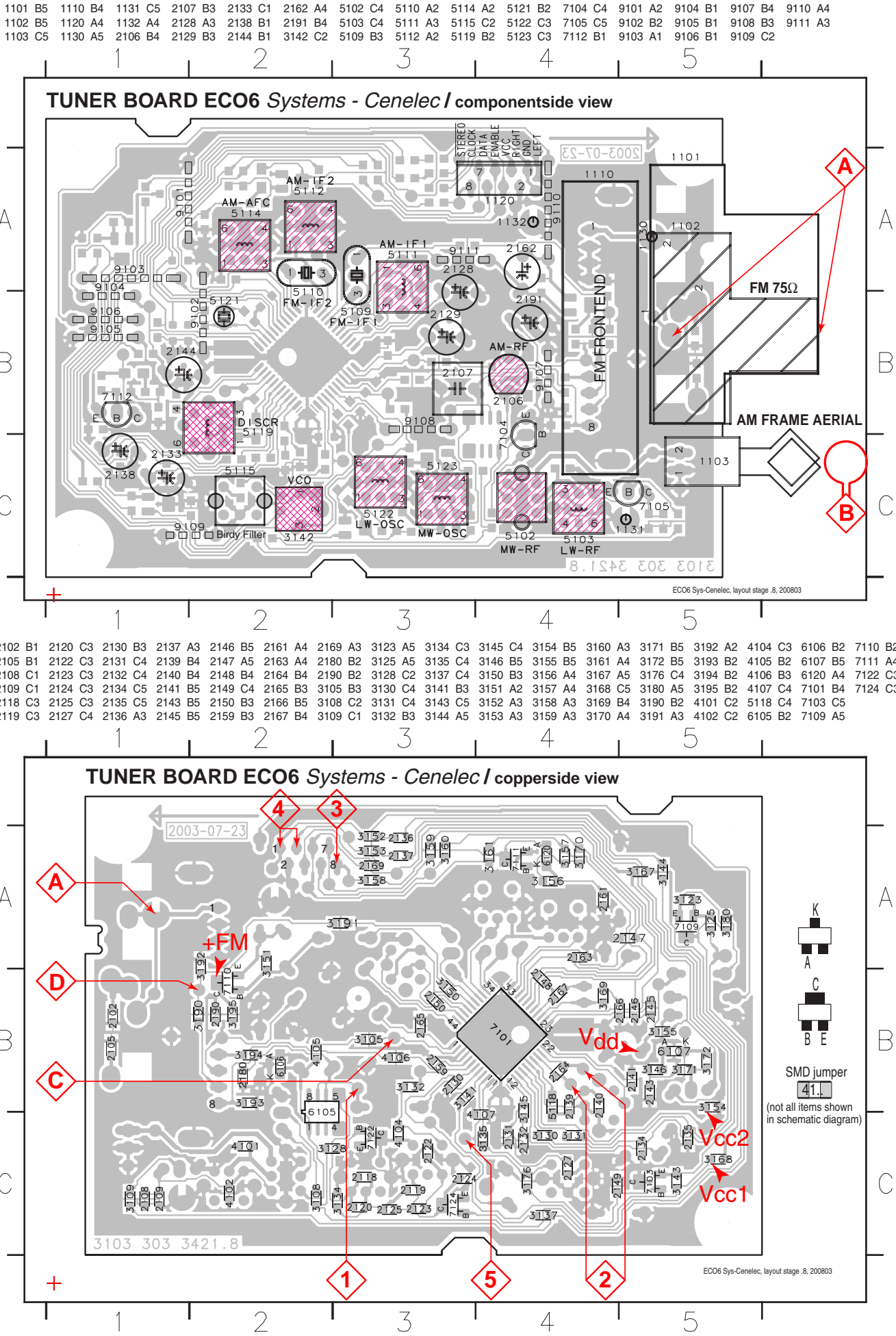
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Electrical Partslist.....	7B-4





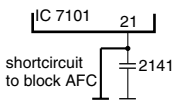
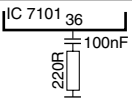
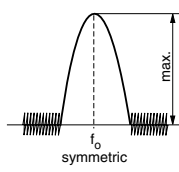
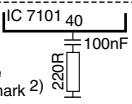
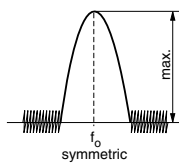
1101 A2  
1102 B1  
1103 E2  
1110 B2  
1120 E14  
1130 A2  
1131 C2  
1132 F13  
1102 B1  
2105 A2  
2106 E3  
2107 E4  
2108 G3  
2109 G3  
2118 H6  
2119 H6  
2120 H6  
2122 I6  
2123 H6  
2124 H6  
2125 H6  
2127 E7  
2128 B8  
2129 C7  
2130 F11  
2131 F8  
2132 F8  
2133 F8  
2134 I8  
2135 I9  
2136 H14  
2137 H13  
2138 F9  
2139 G9  
2140 G9  
2141 F10  
2143 G12  
2144 G11  
2145 E11  
2146 E12  
2147 E12  
2148 E12  
2149 H7  
2150 A10  
2159 D5  
2161 C1  
2162 H12  
2163 D11  
2164 G10  
2165 C7  
2166 E11  
2167 E11  
2169 G8  
2180 C4  
2190 C3  
2191 C3  
3105 D5  
3108 D2  
3109 G4  
3123 H3  
3125 H2  
3128 H3  
3130 I9  
3131 I9  
3132 G4  
3134 H6  
3135 E7  
3137 H7  
3141 E7  
3142 E6  
3143 G7  
3144 G8  
3145 F8  
3146 G13  
3150 H12  
3151 H12  
3152 G14  
3153 G13  
3154 F13  
3155 G12  
3156 C12  
3157 D12  
3158 E13  
3159 D13  
3160 D13  
3161 D13  
3167 F12  
3168 F11  
3169 E11  
3170 D12  
3171 G12  
3172 G12  
3176 H7  
3180 I3  
3190 B6  
3191 B7  
3192 B6  
3193 B4  
3194 C4  
3195 C3  
4101 E2  
4102 F3  
4104 H5  
5102 E3  
5103 F2  
5109 B9  
5110 B10  
5111 A9  
5112 A11  
5114 B11  
5115 E7  
5118 G9  
5119 G9

5121 E11  
5122 H5  
5123 G5  
6105-1 E4  
6105-2 G6  
6106 D4  
6107 G13  
6120 C13  
7101 C8  
7103 H8  
7104 D2  
7105 F4  
7109 H3  
7110 H12  
7111 C13  
7112 G12  
7122 H4  
7124 H7  
T102 B2  
T103 B2  
T104 B6  
T105 E2  
T106 E2  
T107 C3  
T109 D5  
T110 D5  
T111 E5  
T112 F7  
T113 A9  
T114 B11  
T116 F10  
T117 F13  
T118 G11  
T120 F13  
T121 F13  
T122 E13  
T123 E13  
T124 G14  
T125 F14  
T126 F13  
T127 F13  
T140 F11  
T141 F10  
T142 F10



These assembly drawings show a summary of all possible versions.  
For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE ( ECO6 Cenelec FM/MW - and FM/MW/LW - versions with AM-frame aerial )

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
<b>FM</b> 87.5 - 108MHz (50kHz grid)			108MHz	check	1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
<b>MW</b> 531 - 1602kHz (9kHz grid)			1602kHz	5123		8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
<b>FM</b>	10.7MHz, 45mV continuous wave	D		5119	2	0mV ±3mV
FM - VCO						
<b>FM</b>	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
FM RF (channel separation)      Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.						
<b>FM</b>	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	A	98MHz	IF coil inside FM frontend 1110	4	right channel min.
AM IF						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C		5111	5	
				5112		
<b>AM AFC</b> <b>MW</b>			C	continuous wave V <sub>RF</sub> = 2mV	5114	2
AM RF <sup>3)</sup>						
<b>MW</b>	1494kHz	B	1494kHz	2106	5	
	558kHz		558kHz	5102		
<b>LW</b>	198kHz	Δf = ±30kHz V <sub>RF</sub> as low as possible	198kHz	5103		

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

- <sup>1)</sup> If sensitivity of frequency counter is too low adjust to max. channel separation  
(input signal: stereo left 90% + 9%, adjust output on right channel to minimum)
- <sup>2)</sup> RC network serves for damping the IF-filter while adjusting the other one.
- <sup>3)</sup> For AM RF adjustments the original frame antenna has to be used!  
MW has to be aligned before LW.

↑ Repeat

MISCELLANEOUS

1101	2422 015 19376	SOCKET CLICKFIT 2P	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR, 2 POLE	
1110	2422 542 90071	FM FRONTEND	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2102©	4822 126 13838	100nF	10%	50V	not USA
2105©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00204	TRIMCAP. 4,2 - 20pF, N750			LW only
2106	2020 800 00191	TRIMCAP. 3 - 11pF, N450			FM/AM only
2107	4822 121 51319	1μF	20%	50V	
2108©	5322 122 32531	100pF	5%	50V	LW only
2109©	5322 122 32448	10pF	5%	50V	LW only
2120©	4822 126 13689	18pF	1%	63V	FM/AM only
2120©	5322 122 32658	22pF	5%	50V	LW only
2122©	4822 122 33891	3,3nF	10%	63V	LW only
2123©	2020 552 93494	390pF	1%	50V	LW only
2124©	4822 122 33177	10nF	20%	50V	FM/AM only
2125©	2020 552 96199	560pF	1%	50V	
2127©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10μF	20%	63V	
2129	4822 124 41584	100μF	20%	10V	
2130©	5322 122 32654	22nF	10%	63V	
2131©	4822 126 13482	470nF	20%	16V	
2132©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1μF	20%	63V	
2134©	3198 017 31530	15nF	10%	50V	not USA
2134©	5322 122 32654	22nF	10%	63V	USA only
2135©	3198 017 31530	15nF	10%	50V	not USA
2135©	3198 017 32230	22nF	10%	25V	USA only
2136©	4822 126 14076	220nF	20%	25V	
2137©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2μF	20%	50V	
2139©	4822 126 14236	15pF	5%	50V	
2140©	4822 126 13695	82pF	1%	63V	
2141©	4822 126 13838	100nF	10%	50V	
2143©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1μF	20%	63V	
2145©	4822 122 33575	220pF	5%	50V	
2146©	4822 122 33575	220pF	5%	50V	
2147©	4822 122 33575	220pF	5%	50V	
2148©	4822 122 33127	2,2nF	10%	63V	
2149©	5322 122 32659	33pF	5%	50V	RDS only
2150©	4822 126 13838	100nF	10%	50V	
2159©	5322 122 31151	22μF	20%	50V	
2163©	4822 126 13838	100nF	10%	50V	LW only
2164©	4822 126 13482	470nF	20%	16V	
2165©	4822 126 13838	100nF	10%	50V	
2166©	5322 122 31647	1nF	10%	63V	
2167©	4822 122 33926	12pF	5%	50V	
2169©	4822 122 33127	2,2nF	10%	63V	RDS only
2180©	3198 017 31030	10nF	10%	50V	
2190©	4822 126 13838	100nF	10%	50V	
2191	4822 124 40178	100μF	20%	10V	

RESISTORS

3105©	4822 117 11503	220Ω	5%	0,1W	
3108©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3109©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3123©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3125©	4822 117 10833	10kΩ	1%	0,1W	LW only

RESISTORS

3128©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3130©	3198 021 38210	820Ω	5%	0,06W	
3131©	3198 021 38210	820Ω	5%	0,06W	
3132©	4822 051 20479	47Ω	5%	0,1W	
3134©	4822 051 20223	22kΩ	5%	0,1W	
3135©	3198 021 31020	1kΩ	5%	0,06W	
3137©	4822 051 20223	22kΩ	5%	0,1W	LW only
3141©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146©	4822 051 20229	22Ω	5%	0,1W	
3150©	4822 117 10833	10kΩ	1%	0,1W	
3151©	4822 051 20683	68kΩ	5%	0,1W	
3152©	4822 051 20471	470Ω	5%	0,1W	
3153©	4822 051 20471	470Ω	5%	0,1W	
3154©	4822 117 13577	330Ω	1%	0,1W	
3155©	4822 117 10353	150Ω	5%	0,1W	
3156©	4822 117 10837	100kΩ	1%	0,1W	
3157©	4822 117 10837	100kΩ	1%	0,1W	
3158©	4822 051 20471	470Ω	5%	0,1W	
3159©	4822 051 20471	470Ω	5%	0,1W	
3160©	4822 051 20471	470Ω	5%	0,1W	
3161©	4822 051 20223	22kΩ	5%	0,1W	
3167©	4822 051 20121	120Ω	5%	0,1W	
3168©	4822 051 20121	120Ω	5%	0,1W	
3169©	4822 051 20154	150kΩ	5%	0,1W	
3170©	4822 117 10837	100kΩ	1%	0,1W	
3171©	4822 117 10834	47kΩ	1%	0,1W	
3172©	4822 051 20562	5,6kΩ	5%	0,1W	
3176©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3180©	4822 117 10833	10kΩ	1%	0,1W	LW only
3190©	4822 051 20121	120Ω	5%	0,1W	
3191©	4822 051 20121	120Ω	5%	0,1W	
3192©	4822 117 13577	330Ω	1%	0,1W	
3193©	4822 117 13577	330Ω	1%	0,1W	
3194©	4822 117 11449	2,2kΩ	1%	0,1W	
3195©	4822 051 20101	100Ω	5%	0,1W	
4101©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4102©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4104©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4105©	4822 051 20008	CHIP JUMPER 0805			
4106©	4822 051 20008	CHIP JUMPER 0805			
4107©	4822 051 20008	CHIP JUMPER 0805			
5102	4822 157 71634	RF-COIL MW			
5103	2422 549 44107	RF-COIL LW			LW only
5109	4822 157 71639	FM-IF FILTER 10,7MHz			
5110	4822 242 70665	FM-IF FILTER 10,7MHz			
5111	2422 549 44023	AM-IF FILTER 450kHz			
5112	4822 157 70302	AM-IF FILTER 450kHz			
5114	4822 157 70302	AM-IF FILTER 450kHz			
5115	4822 157 71636	ANTI BIRDY FILTER			
5118©	2422 535 95881	100nH			
5119	4822 157 11443	DISCRIMINATOR COIL			
5121	4822 242 10261	QUARTZ 75kHz			
5122	2422 549 44108	RF-COIL, LW-OSCILLATOR			LW only
5123	2422 549 44108	RF-COIL, MW-OSCILLATOR			

DIODES

6105©	4822 130 83075	HN1V02H	
6106©	4822 130 83757	BAS216	
6107©	9340 386 90115	BZX284-C11	
6120©	4822 130 83757	BAS216	

TRANSISTORS

7103©	5322 130 42756	BC857C	RDS only
7104	9322 003 64676	TBC337-40	LW only
7105	9322 003 64676	TBC337-40	LW only
7109©	4822 130 60373	BC856B	LW only
7110©	4822 130 60373	BC856B	
7111©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	
7122©	5322 130 42755	BC847C	LW only
7124©	5322 130 42755	BC847C	LW only

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC	
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Brief introduction of the Mains Board

ECO Power  
Standby Transformer 5203 provides the LPS supply to control the relay 1210, cutting of the Mains supply to the Mains transformer during the ECO Power (standby) mode.

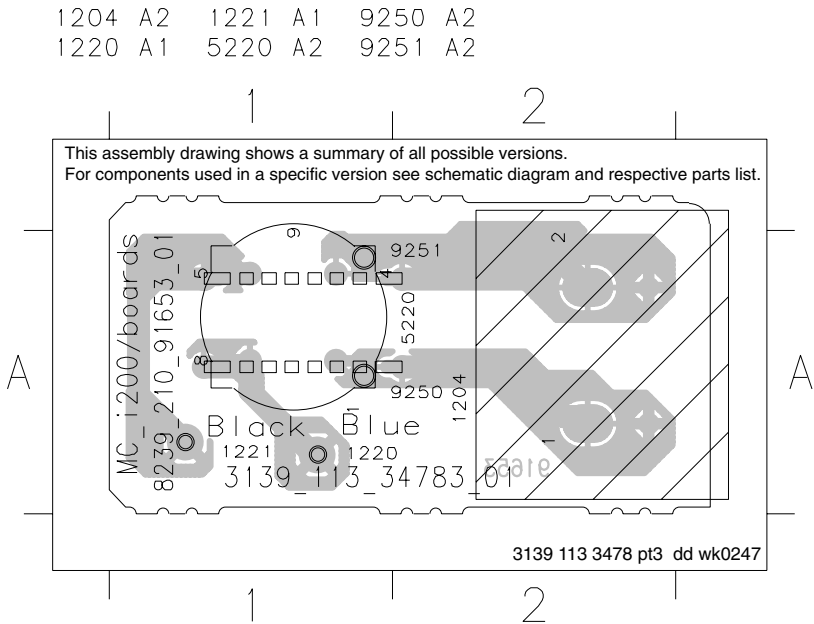
- The Mains transformer provides the following:
- 5V6\_ECO for Low Power Supply
  - +A, +A/2 and +B to the Combi board

MAINS BOARD

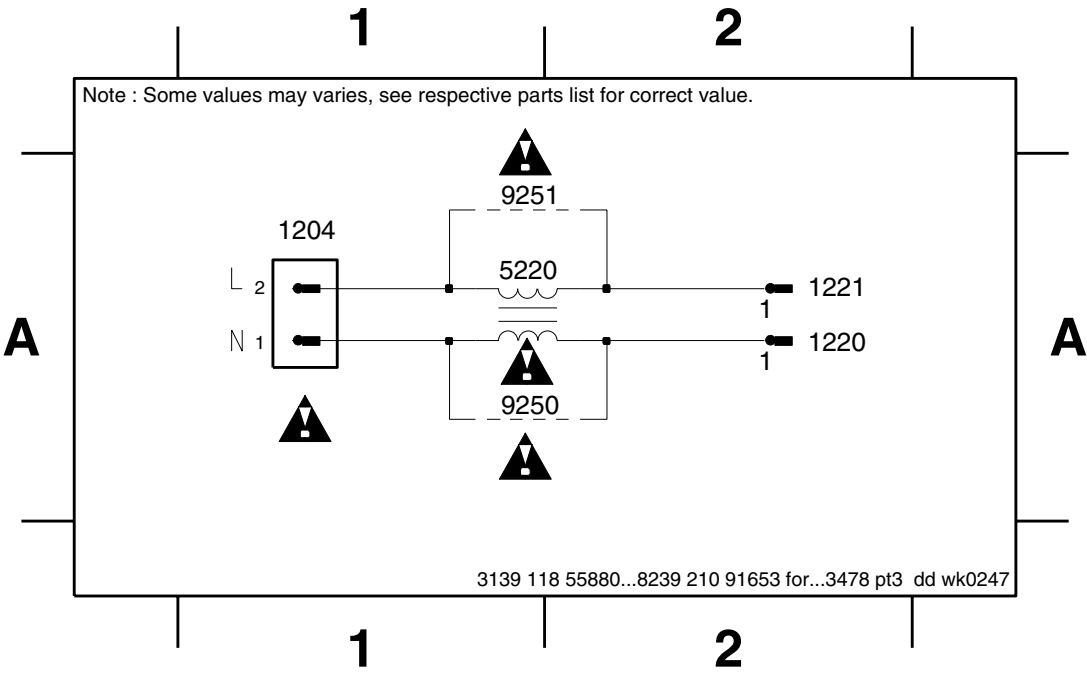
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Mains Socket - Circuit diagram & Component layout ..... 8-1  
Mains Board - Component layout ..... 8-2  
Mains Board - Chip layout ..... 8-3  
Mains Board - Circuit diagram ..... 8-4  
Electrical parts list ..... 8-5

MAINS SOCKET - CIRCUIT DIAGRAM & COMPONENT LAYOUT

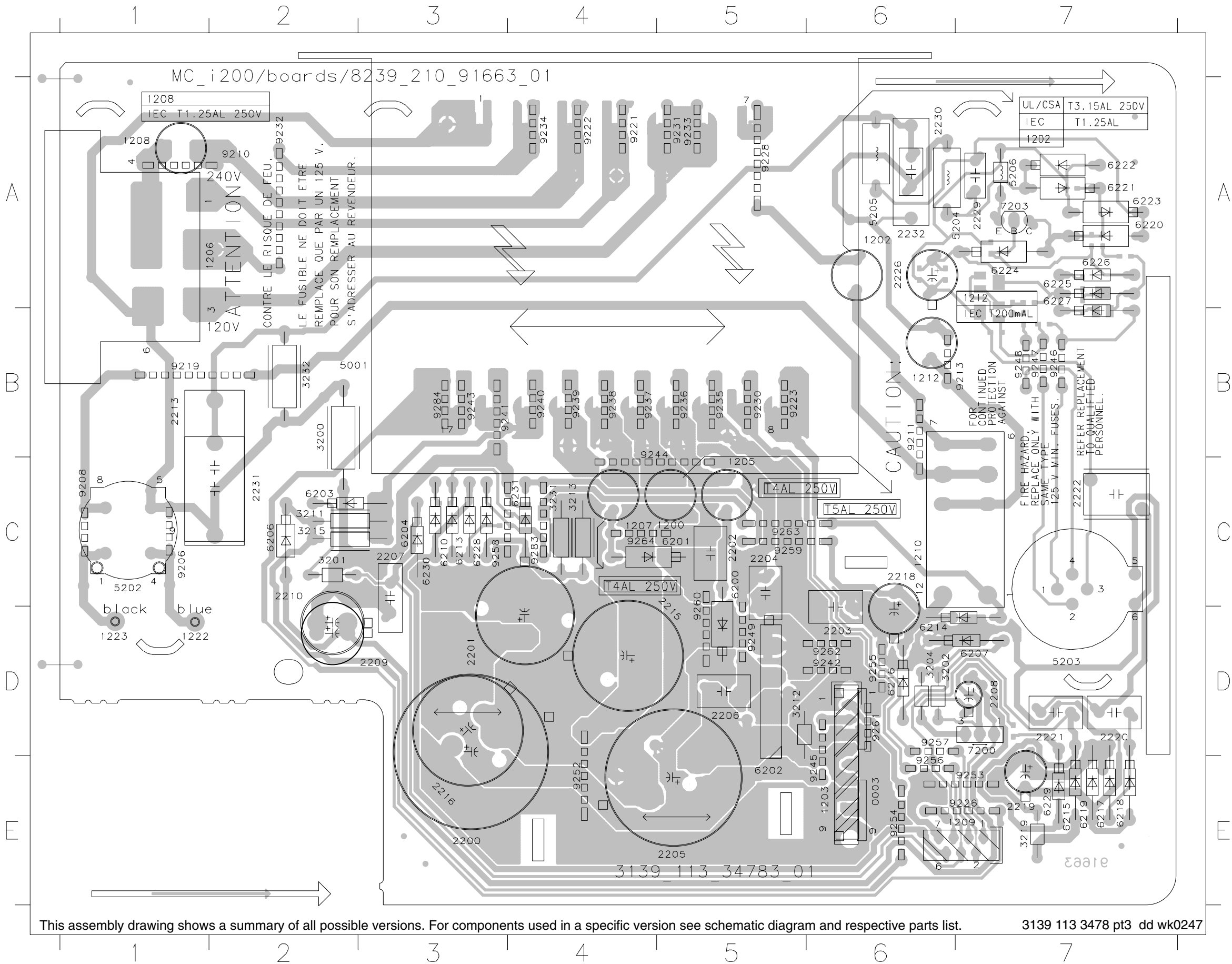


1204 A1 1220 A2 1221 A2 5220 A1 9250 A1 9251 A1



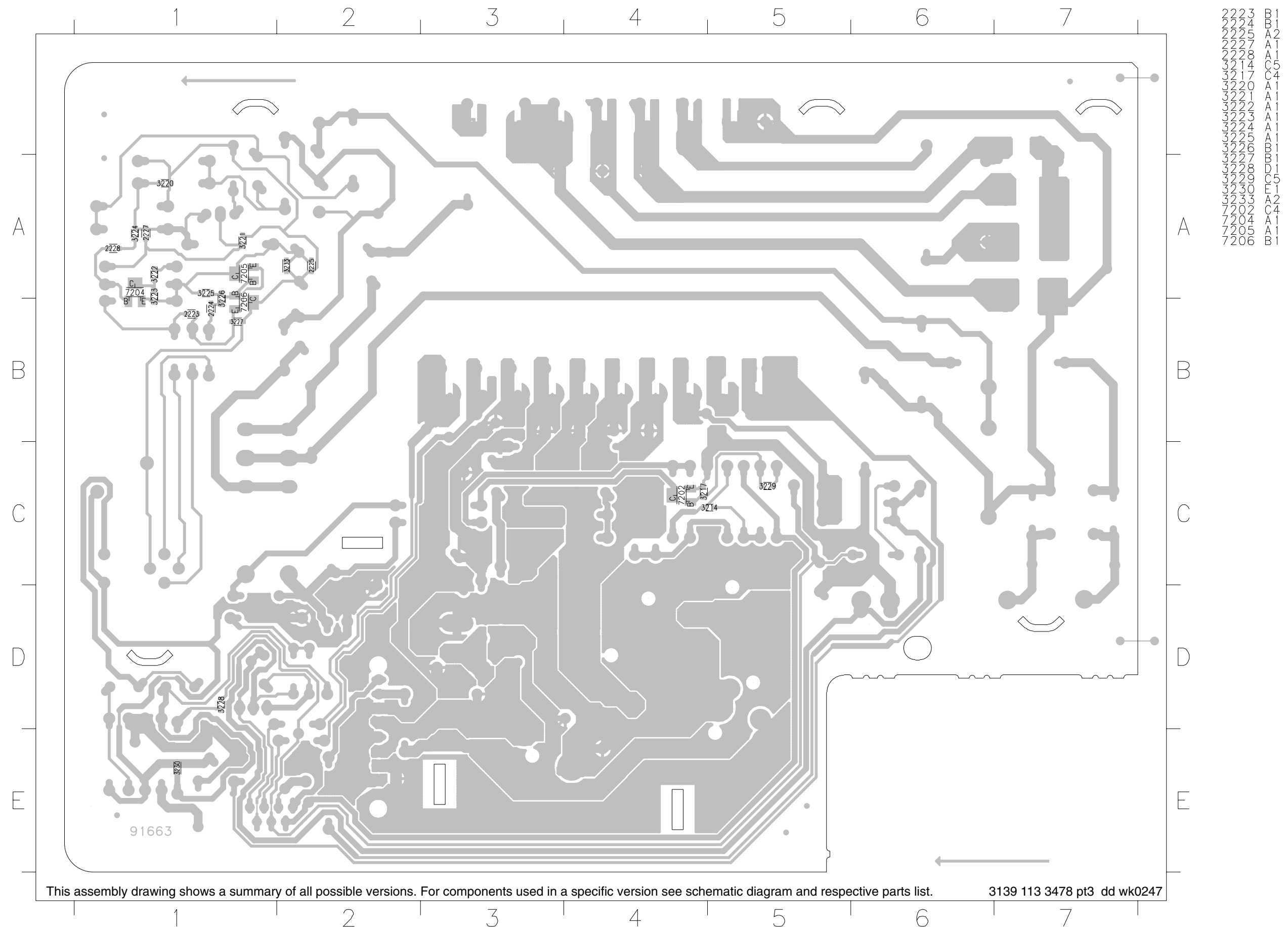


MAINS BOARD - COMPONENT LAYOUT

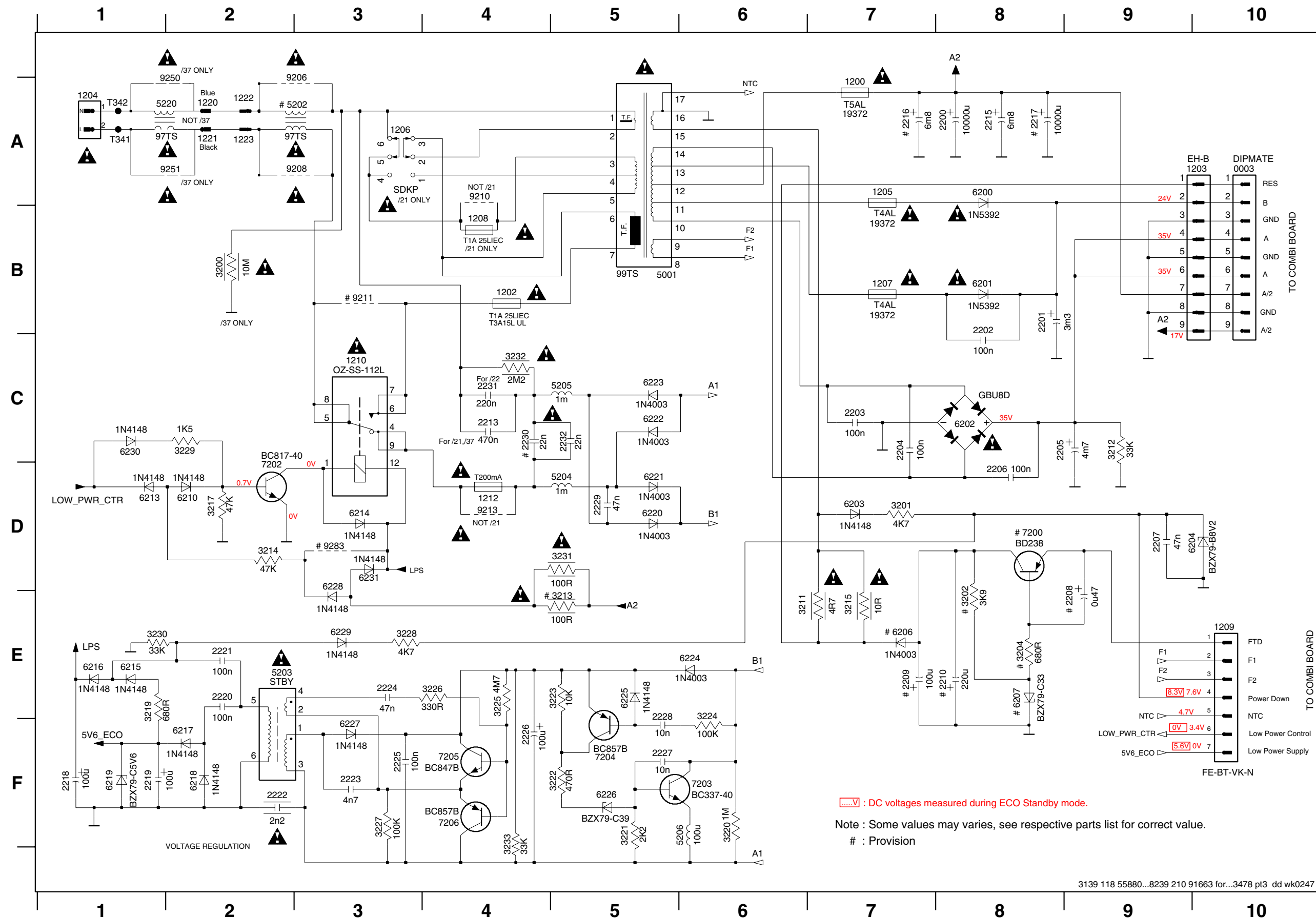


000	E6
001	C6
002	F6
003	C6
004	F6
005	C6
006	F6
007	C6
008	F6
009	C6
010	F6
011	C6
012	F6
013	C6
014	F6
015	C6
016	F6
017	C6
018	F6
019	C6
020	F6
021	C6
022	F6
023	C6
024	F6
025	C6
026	F6
027	C6
028	F6
029	C6
030	F6
031	C6
032	F6
033	C6
034	F6
035	C6
036	F6
037	C6
038	F6
039	C6
040	F6
041	C6
042	F6
043	C6
044	F6
045	C6
046	F6
047	C6
048	F6
049	C6
050	F6
051	C6
052	F6
053	C6
054	F6
055	C6
056	F6
057	C6
058	F6
059	C6
060	F6
061	C6
062	F6
063	C6
064	F6
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066	F6
067	C6
068	F6
069	C6
070	F6
071	C6
072	F6
073	C6
074	F6
075	C6
076	F6
077	C6
078	F6
079	C6
080	F6
081	C6
082	F6
083	C6
084	F6
085	C6
086	F6
087	C6
088	F6
089	C6
090	F6
091	C6
092	F6
093	C6
094	F6
095	C6
096	F6
097	C6
098	F6
099	C6
100	F6

## MAINS BOARD - CHIP LAYOUT



## MAINS BOARD - CIRCUIT DIAGRAM



3139 118 55880...8239 210 91663 for...3478 pt3 dd wk0247

0003 A10	6219 F1
1200 A7	6220 D5
1202 B4	6221 D5
1203 A9	6222 C5
1205 A7	6223 C5
1206 A3	6224 E6
1207 B7	6225 E5
1208 B4	6226 F5
1209 E10	6227 F3
1210 C3	6228 D3
1212 D4	6229 E3
1222 A2	6230 C1
1223 A2	6231 D3
2200 A8	7200 D8
2201 B8	7202 D2
2202 B8	7203 F6
2203 C7	7204 E5
2204 C7	7205 F4
2205 C8	7206 F4
2206 D8	9206 A3
2207 D9	9208 A3
2208 E9	9210 A4
2209 E7	9211 B3
2210 E8	9213 D4
2213 C4	9283 D3
2215 A8	
2216 A7	
2217 A8	
2218 F1	
2219 F1	
2220 E2	
2221 E2	
2222 F2	
2223 F3	
2224 E3	
2225 F3	
2226 F4	
2227 F5	
2228 E5	
2229 D5	
2230 C4	
2231 C4	
2232 C5	
3200 B2	
3201 D7	
3202 E8	
3204 E8	
3211 E6	
3212 C9	
3213 E5	
3214 D2	
3215 E7	
3217 D2	
3219 E1	
3220 F6	
3221 F5	
3222 F5	
3223 E5	
3224 F6	
3225 E4	
3226 E4	
3227 F3	
3228 E3	
3229 C2	
3230 E1	
3231 D5	
3232 C4	
3233 F4	
5001 B5	
5202 A3	
5203 E3	
5204 D5	
5205 C5	
5206 F6	
6200 A8	
6201 B8	
6202 C8	
6203 D7	
6204 D9	
6206 E7	
6207 E8	
6210 D2	
6213 D1	
6214 D3	
6215 E1	
6216 E1	
6217 F2	
6218 F2	

**ELECTRICAL PARTS LIST - MAINS BOARD****MISCELLANEOUS**

1200	2422 086 10963	△ Fuse RAD LT 5A 250V	
1202	4822 071 51252	△ Fuse RAD LT 1,25A 250V/22	
1202	4822 252 51121	△ Fuse RAD LT 3,15A 250V/37	
1204	4822 265 31015	△ Mains Socket	/22
1204	2422 030 00328	△ Mains Socket	/37
1205	2422 086 10786	△ Fuse RAD LT 4A 250V	
1207	2422 086 10786	△ Fuse RAD LT 4A 250V	
1209	4822 267 10953	Flex Connector 7P	
1210	2422 132 07519	△ Relay 1P 12V 16A OZ-SS	

**CAPACITORS**

2200	4822 124 12012	4700uF 20% 25V	
2201	4822 124 42367	3300uF 20% 35V	
2202	5322 121 42386	100nF 5% 63V	
2203	5322 121 42386	100nF 5% 63V	
2204	5322 121 42386	100nF 5% 63V	
2205	4822 124 80415	4700uF 20% 50V	
2206	5322 121 42386	100nF 5% 63V	
2207	4822 126 14559	47nF 50V	
2208	5322 124 41948	470nF 20% 50V	
2210	2020 012 93547	100uF 20% 63V	
2213	4822 126 13589	△ 470nF 275V	/37
2218	2020 012 93583	100uF 20% 25V	/22
2218	3198 029 31010	100uF 20% 25V	/37
2219	4822 124 23052	100uF 20% 16V	
2220	5322 121 42386	100nF 5% 63V	
2221	5322 121 42386	100nF 5% 63V	
2222	2020 554 90173	△ 2,2nF 20% 250V	
2223	4822 126 13193	4,7nF 10% 63V	
2224	3198 017 34730	47nF 16V	
2225	2238 586 59812	100nF +80/-20% 50V	
2226	4822 124 40255	100uF 20% 63V	
2227	5322 126 11583	10nF 10% 50V	
2228	5322 126 11583	10nF 10% 50V	
2229	4822 121 43526	47nF 5% 250V	
2231	2222 338 22224	△ 220nF 20% 275V	/22
2232	2222 336 19106	△ 22nF 20% 275V	

**RESISTORS**

3200	4822 053 21106	△ 10M 5% 0,5W	/37
3201	4822 116 52283	4k7 5% 0,5W	
3202	4822 116 52276	3k9 5% 0,5W	
3204	4822 116 52228	680R 5% 0,5W	
3211	4822 052 10478	△ 4R7 5% 0,33W	
3212	4822 050 23303	33k 1% 0,6W	
3214	4822 117 12925	47k 1% 0,063W	
3215	4822 052 10109	△ 10R 5% 0,33W	
3217	4822 117 12925	47k 1% 0,063W	
3219	4822 116 52228	680R 5% 0,5W	
3220	4822 051 30105	1M 5% 0,062W	
3221	4822 051 30222	2k2 5% 0,062W	
3222	4822 051 30471	470R 5% 0,062W	

3223	4822 051 30103	10k 5% 0,062W	
3224	4822 117 13632	100k 1% 0,62W	
3225	4822 051 30475	4M7 5% 0,062W	
3226	4822 051 30331	330R 5% 0,062W	
3227	4822 117 13632	100k 1% 0,62W	
3228	4822 051 30472	4k7 5% 0,062W	
3229	4822 051 30472	4k7 5% 0,062W	
3230	4822 051 30333	33k 5% 0,062W	
3231	4822 052 10101	△ 100R 5% 0,33W	
3232	4822 053 21225	△ 2M2 5% 0,5W	
3233	4822 051 30333	33k 5% 0,062W	

**COILS & FILTERS**

5203	2422 549 45157	△ TRAFO STANDBY 3A1631N	
5204	4822 157 53473	Coil 1000uH 10%	
5205	4822 157 53473	Coil 1000uH 10%	
5206	4822 157 11228	Coil 100uH 5%	
5220	4822 157 11832	△ FIL MAINS 400uH 3A	/22

**DIODES**

6200	4822 130 31878	△ 1N4003G	
6200	5322 130 80686	△ 1N5392	
6201	4822 130 31878	△ 1N4003G	
6201	5322 130 80686	△ 1N5392	
6202	4822 130 11139	△ GBU8D	
6203	4822 130 30621	1N4148	
6204	4822 130 34382	BZX79-B8V2	
6206	4822 130 31878	1N4003G	
6207	4822 130 34142	BZX79-C33	
6210	4822 130 30621	1N4148	
6213	4822 130 30621	1N4148	
6214	4822 130 30621	1N4148	
6215	4822 130 30621	1N4148	
6216	4822 130 30621	1N4148	
6217	4822 130 30621	1N4148	
6218	4822 130 30621	1N4148	
6219	4822 130 34173	BZX79-C5V6	
6220	4822 130 31878	1N4003G	
6221	4822 130 31878	1N4003G	
6222	4822 130 31878	1N4003G	
6223	4822 130 31878	1N4003G	
6224	4822 130 31878	1N4003G	
6225	4822 130 30621	1N4148	
6226	4822 130 34145	BZX79-C39	
6227	4822 130 30621	1N4148	
6228	4822 130 30621	1N4148	
6229	4822 130 30621	1N4148	
6230	4822 130 30621	1N4148	
6231	4822 130 30621	1N4148	

**TRANSISTORS & INTEGRATED CIRCUITS**

7200	4822 130 40917	BD238	
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***ELECTRICAL PARTS LIST - MAINS BOARD***

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**TRANSISTORS & INTEGRATED CIRCUITS**

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7202	4822 130 42804	BC817-25
7203	4822 130 40855	BC337-40
7204	4822 130 60373	BC857B
7205	5322 130 60159	BC847B
7206	4822 130 60373	BC857B

Note : Only the parts mentioned in this list are normal service spare parts.

# ETF8 TAPE MODULE

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Connector assignment .....	9-1
Tape Module Wiring .....	9-2
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Electrical parts list .....	9-8

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701

○	1	REC-L
○	2	REC-R
○	3	GND A
○	4	TAPE-L
○	5	+12V
○	6	TAPE-R
○	7	-CMOS

INTERCONNECTION TO AF BOARD

Record input left
Record input right
AF Ground
Playback output left
D.C. supply (+12V) for AF electronics
Playback output right
Negative d.c. supply (-9V) for controlling JFET J111

CONNECTOR 1703

○	1	GND M
○	2	+MOTOR

INTERCONNECTION TO AF BOARD

Motor Ground
D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706

○	1	CR_IN
○	2	AD1
○	3	+5V
○	4	GND_P
○	5	CLK
○	6	DATA
○	7	STROBE

INTERCONNECTION TO FRONT BOARD

Deck sensing Chrome Tape
Deck sensing switches output voltage / Deck EOT
DC supply (+5V) for deck status ADC network (ref to microprocessor's supply)
Control & Oscillator Ground
HEF4094BT shift register Clock line
HEF4094BT shift register Data line
HEF4094BT shift register Strobe line

CONNECTOR 1710

○	1	GND A
○	2	ERASE HEAD
○	3	R/P HD Rch
○	4	Common
○	5	R/P HD Lch

TAPE HEAD CONNECTIONS

Erase Head ground
Erase Head
R/P Head right channel positive
Pb Head return ground shield
R/P Head left channel positive

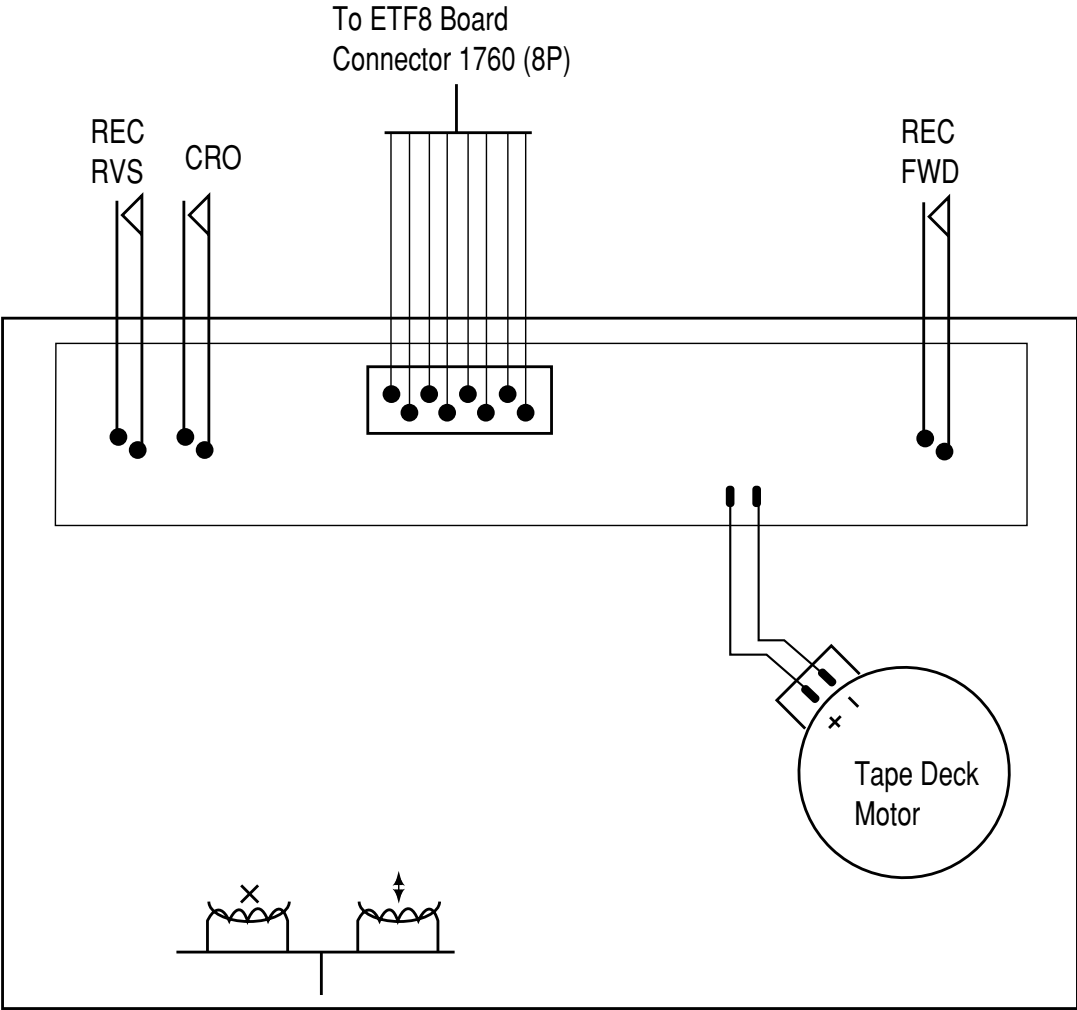
CONNECTOR 1760

○	1	Vcc 12V
○	2	PHOTO
○	3	GND_M
○	4	MODE
○	5	Sol_supply
○	6	CR_IN
○	7	REC FWD
○	8	REC REW

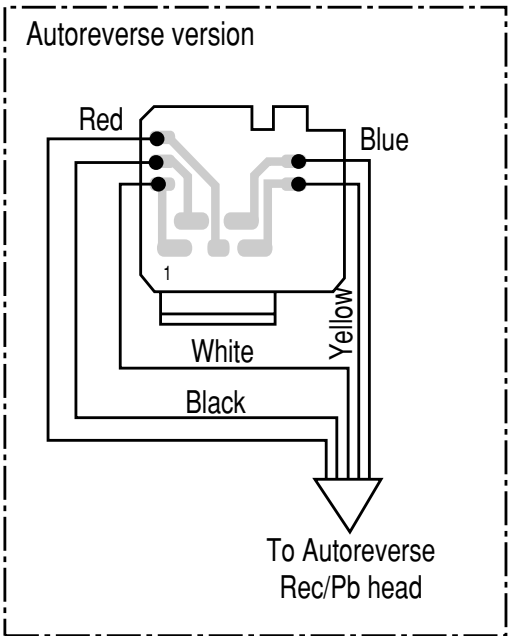
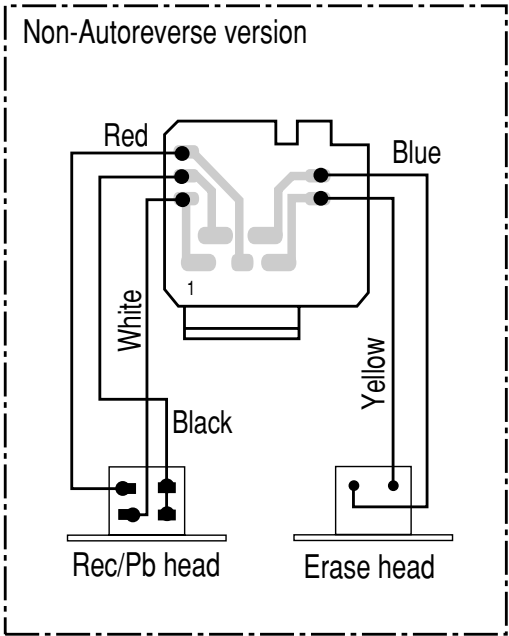
DECK CONTROL INTERFACE

Deck / Motor supply
Photo sensor output (tape movement indication)
Deck / Motor ground
Mode switch (head engagement)
Solenoid supply
Chrome tape detection switch
Record tab protection status switch (forward)
Record tab protection status switch (reverse)

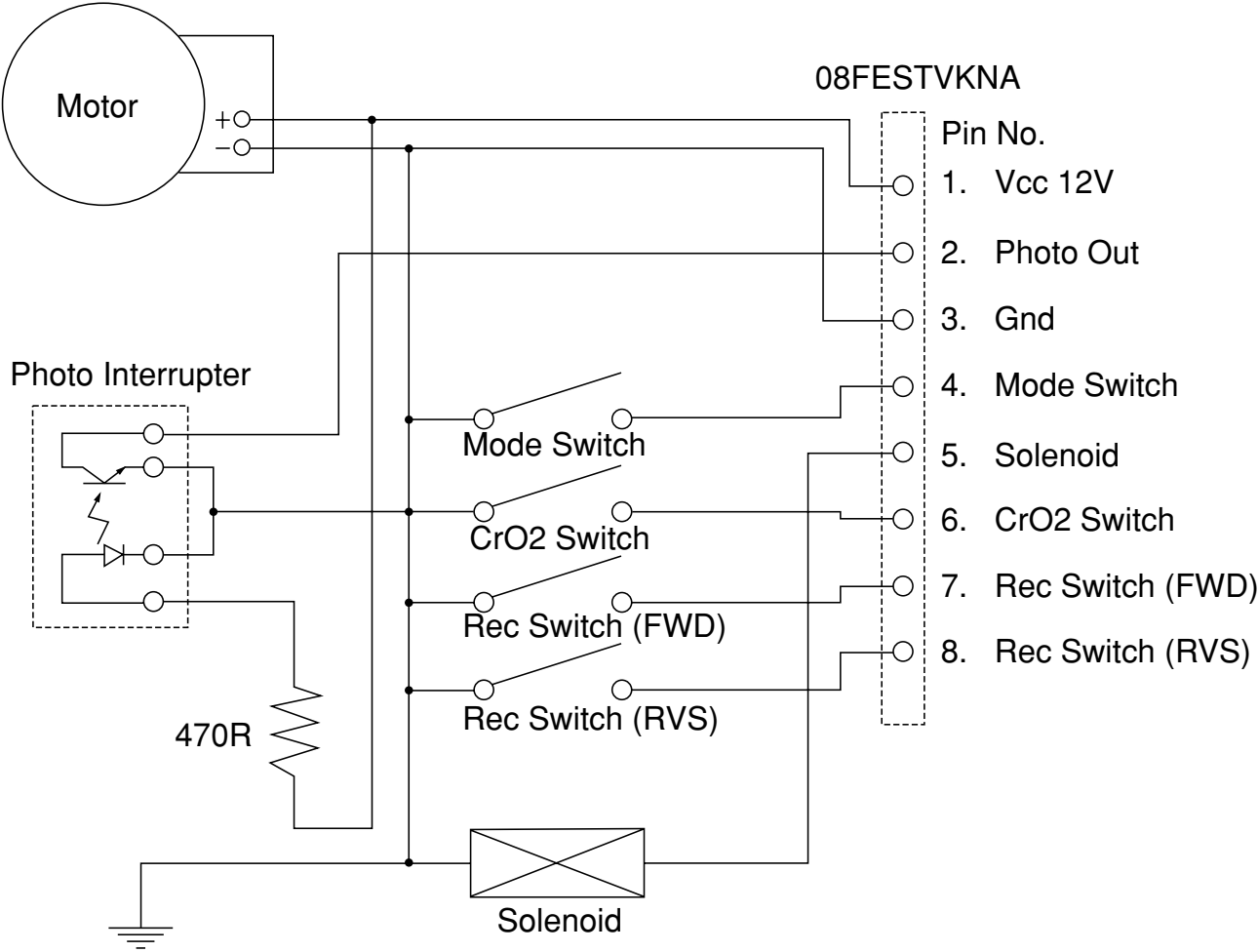
TAPE DECK WIRING



To ETF8 Board  
Connector 1710 (5P)



TAPE MECHANISM ELECTRONICS

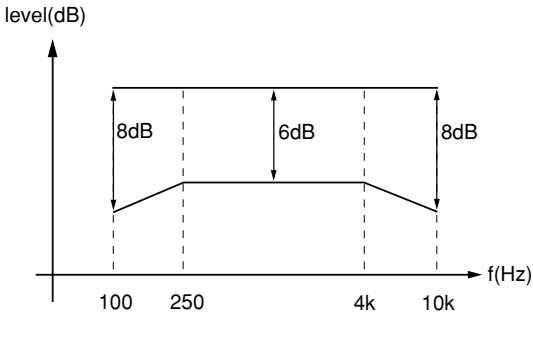
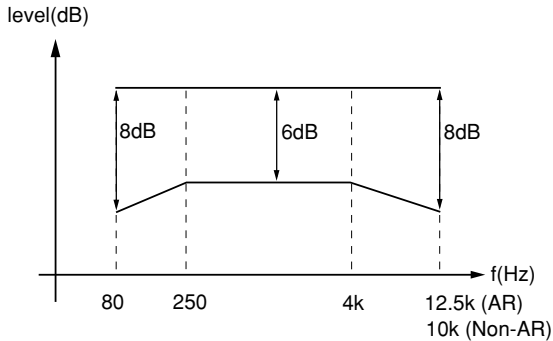


TAPE ADJUSTMENT & CHECK TABLE

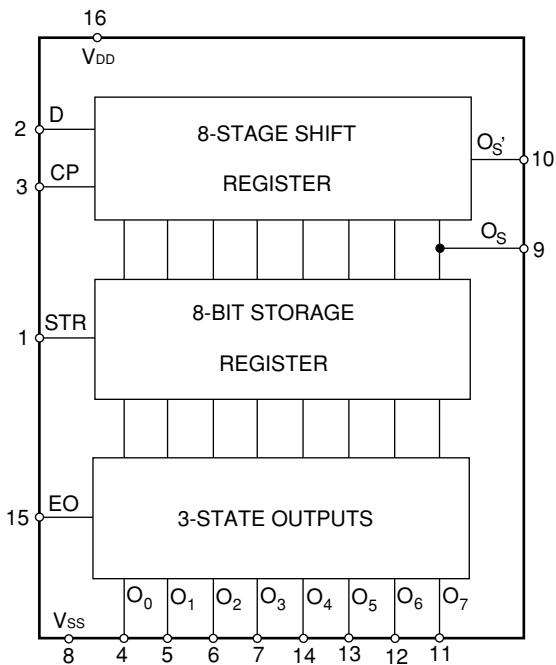
	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
<b>MOTOR SPEED</b>	SBC420 3150Hz	PLAY	<div>1 or 2</div> LEFT RIGHT	frequency counter	check	3150Hz +/- 2%
<b>WOW &amp; FLUTTER</b>	SBC420 3150Hz	PLAY		W&F-meter	check	< 0.4 % DIN
<b>ADJUST AZIMUTH</b>	SBC420 10kHz	PLAY FWD		mV-meter	left hand screw	max. output level & left=right
		PLAY REV ^			right hand screw	
<b>PLAYBACK FREQ. RESPONSE</b>	SBC420	PLAY		mV-meter	check	limits see fig. 1 *
<b>CHECK RECORD/PLAYBACK FREQUENCY AND DISTORTION</b>						
Inject 8.85mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via <div>3 or 4</div>	SBC419A or SBC420	RECORD				
	RECORDED CASSETTE	PLAY	<div>1 or 2</div> LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 28mV via <div>3 or 4</div>	SBC419A or SBC420	RECORD				
	RECORDED CASSETTE	PLAY	<div>1 or 2</div> LEFT RIGHT	THD-meter	check	< 3% *

SBC419A : 4822 397 30069  
SBC420 : 4822 397 30071

^ For Auto-reverse version only  
\* If high frequencies are not within limits, decrease bias and re-measure.  
If distortion is too high, increase bias and re-measure



HEF4094BT FUNCTIONAL BLOCK DIAGRAM



AF Control Logic State Table

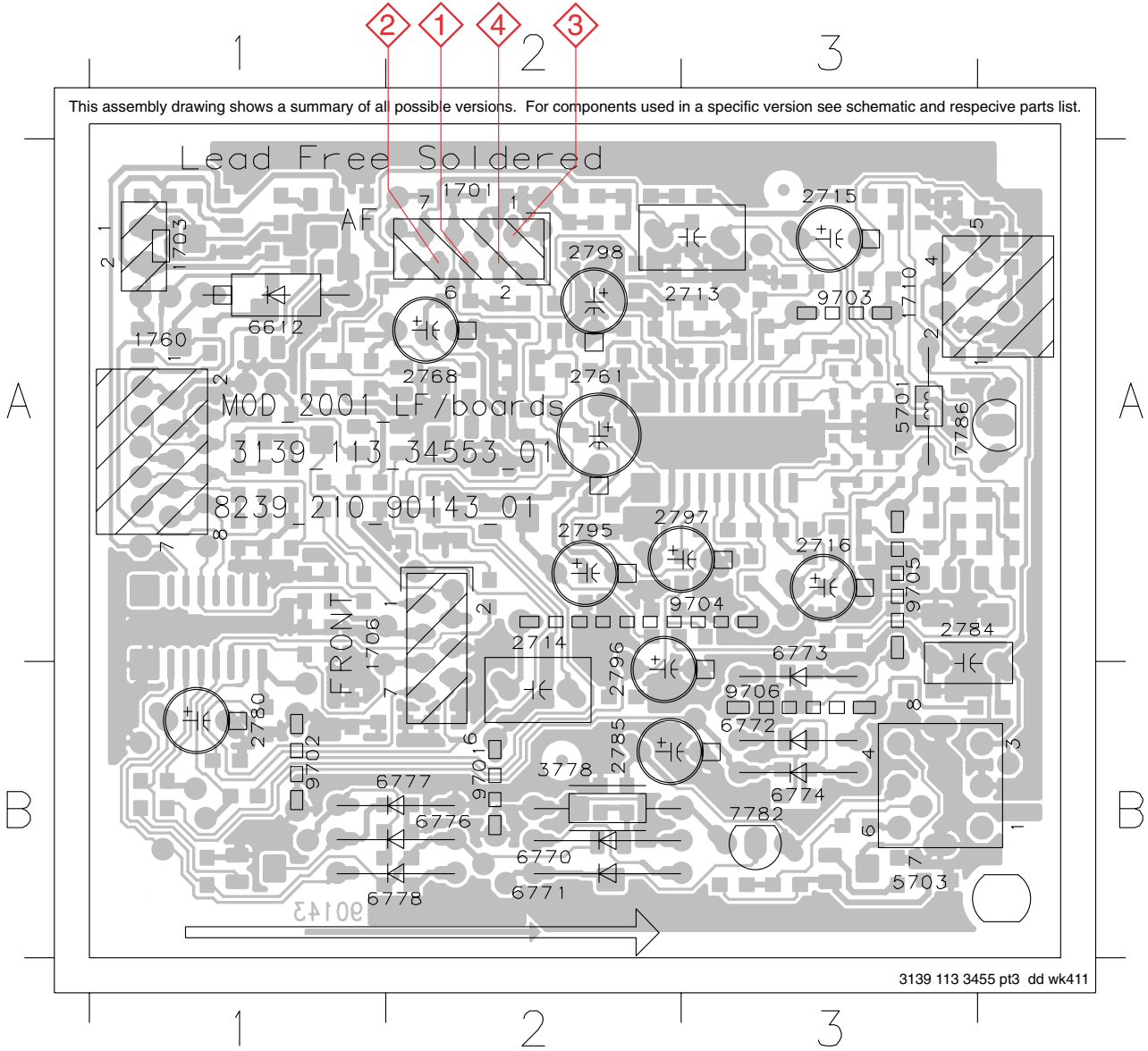
State of Module	Control lines from HEF4094BT							
	O <sub>0</sub>	O <sub>1</sub>	O <sub>2</sub>	O <sub>3</sub>	O <sub>4</sub>	O <sub>5</sub>	O <sub>6</sub>	O <sub>7</sub>
	CR_SEL	REC	BIAS_OFF	CR_BIAS		SOL	MUTE_OFF	MOT
Stop	0	0	1	X	Not in used	Deck Mechanism Timing	0	0
Playback (Ferro)	0	0	1	0			1	1
Playback (Chrome)	1	0	1	1			1	1
Record (Ferro)	0	1	0	0			0	1
Record (Chrome)	1	1	0	1			0	1
FWD	0	0	1	X			0	1
REW	0	0	1	X			0	1

Note: 0 = Logic Low  
1 = Logic High  
X = Not applicable



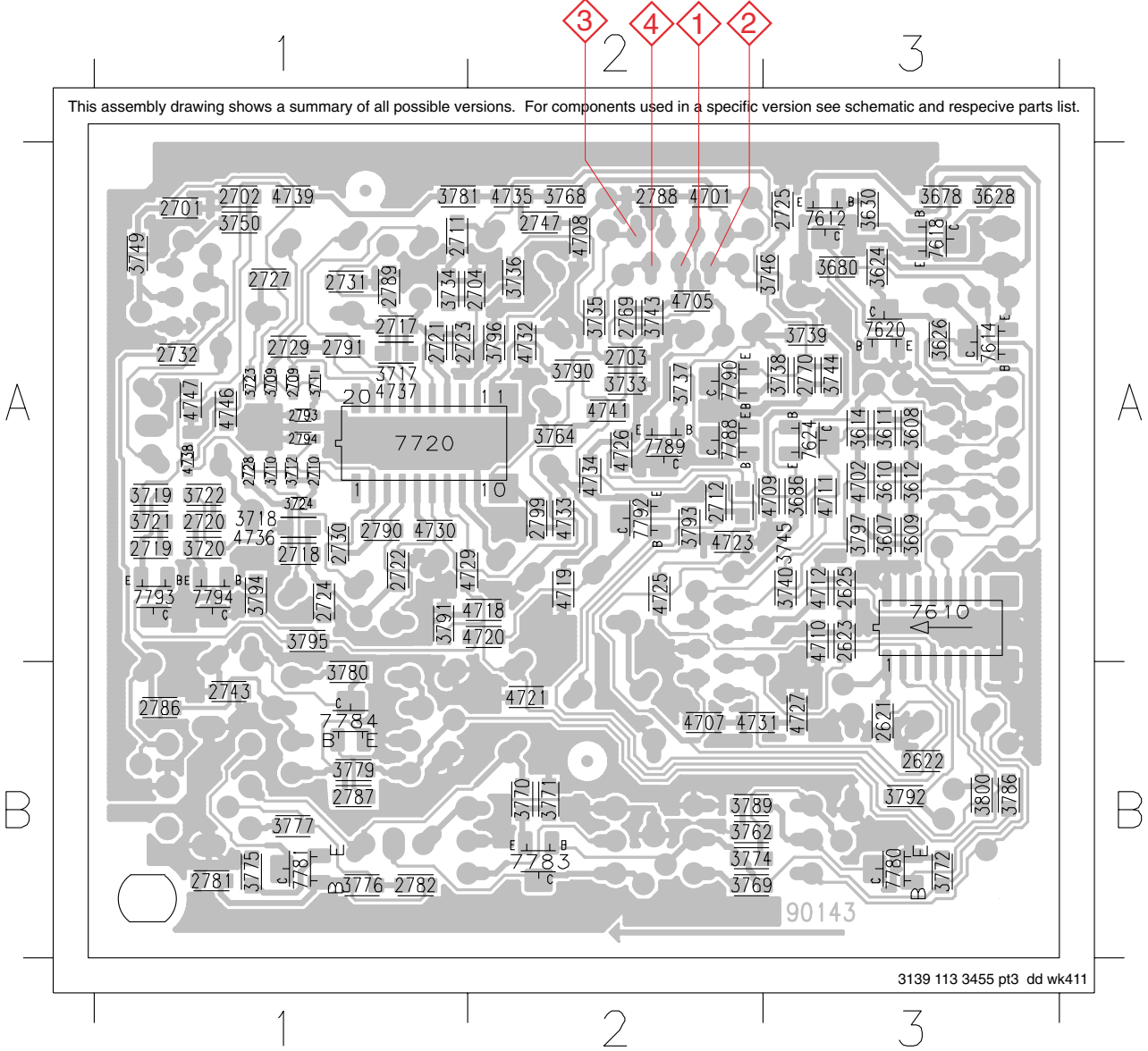
COMPONENT LAYOUT

1701 A2	2715 A3	2795 A2	6612 A1	6777 B2	9704 A3
1703 A1	2716 A3	2796 B2	6770 B2	6778 B2	9705 A3
1706 A1	2761 A2	2797 A2	6771 B2	7782 B3	9706 B3
1710 A3	2768 A2	2798 A2	6772 B3	7786 A3	
1760 A1	2780 B1	3778 B2	6773 A3	9701 B2	
2713 A3	2784 A3	5701 A3	6774 B3	9702 B1	
2714 A2	2785 B2	5703 B3	6776 B2	9703 A3	

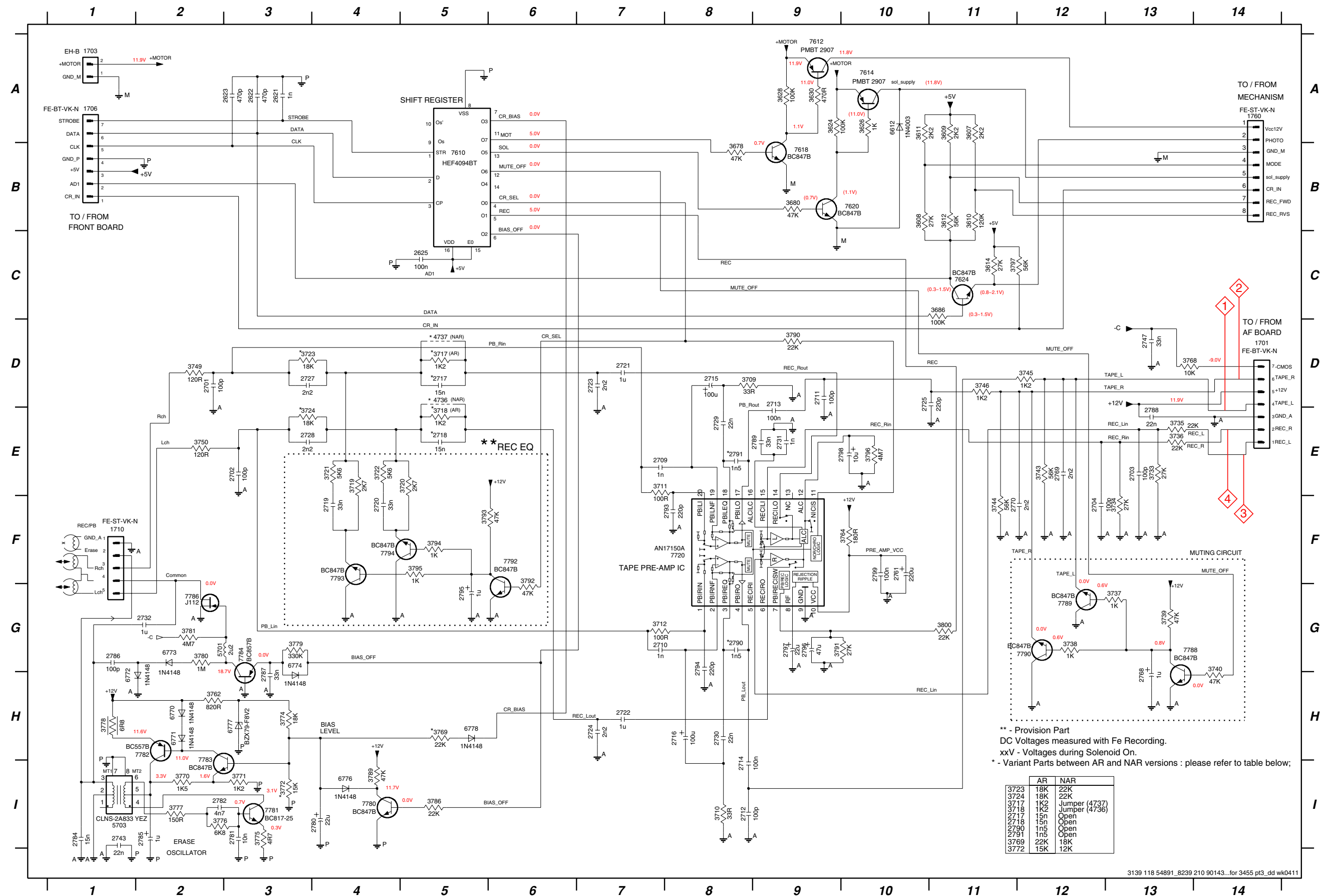


CHIP LAYOUT

2621 B3	2732 A1	3630 A3	3745 A3	3796 A2	4735 A2
2622 B3	2743 B1	3678 A3	3746 A3	3797 A3	4736 A1
2623 A3	2747 A2	3680 A3	3749 A1	3800 B3	4737 A1
2625 A3	2769 A2	3686 A3	3750 A1	4701 A2	4738 A1
2701 A1	2770 A3	3709 A1	3762 B2	4702 A3	4739 A1
2702 A1	2781 B1	3710 A1	3764 A2	4705 A2	4741 A2
2703 A2	2782 B1	3711 A1	3768 A2	4707 B2	4746 A1
2704 A2	2786 B1	3712 A1	3769 B2	4708 A2	4747 A1
2709 A1	2787 B1	3717 A1	3770 B2	4709 A3	7610 A3
2710 A1	2788 A2	3718 A1	3771 B2	4710 A3	7612 A3
2711 A1	2789 A1	3719 A1	3772 B3	4711 A3	7614 A3
2712 A2	2790 A1	3720 A1	3774 B2	4712 A3	7618 A3
2717 A1	2791 A1	3721 A1	3775 B1	4718 A2	7620 A3
2718 A1	2793 A1	3722 A1	3776 B1	4719 A2	7624 A3
2719 A1	2794 A1	3723 A1	3777 B1	4720 A2	7720 A1
2720 A1	2799 A2	3724 A1	3779 B1	4721 B2	7780 B3
2721 A1	3607 A3	3733 A2	3780 B1	4723 A2	7781 B1
2722 A1	3608 A3	3734 A1	3781 A1	4725 A2	7783 B2
2723 A1	3609 A3	3735 A2	3786 B3	4726 A2	7784 B1
2724 A1	3610 A3	3736 A2	3789 B2	4727 B3	7788 A2
2725 A3	3611 A3	3737 A2	3790 A2	4729 A1	7789 A2
2727 A1	3612 A3	3738 A3	3791 A1	4730 A1	7790 A2
2728 A1	3614 A3	3739 A3	3792 B3	4731 B2	7792 A2
2729 A1	3624 A3	3740 A3	3793 A2	4732 A2	7793 A1
2730 A1	3626 A3	3743 A2	3794 A1	4733 A2	7794 A1
2731 A1	3628 A3	3744 A3	3795 A1	4734 A2	



## CIRCUIT DIAGRAM



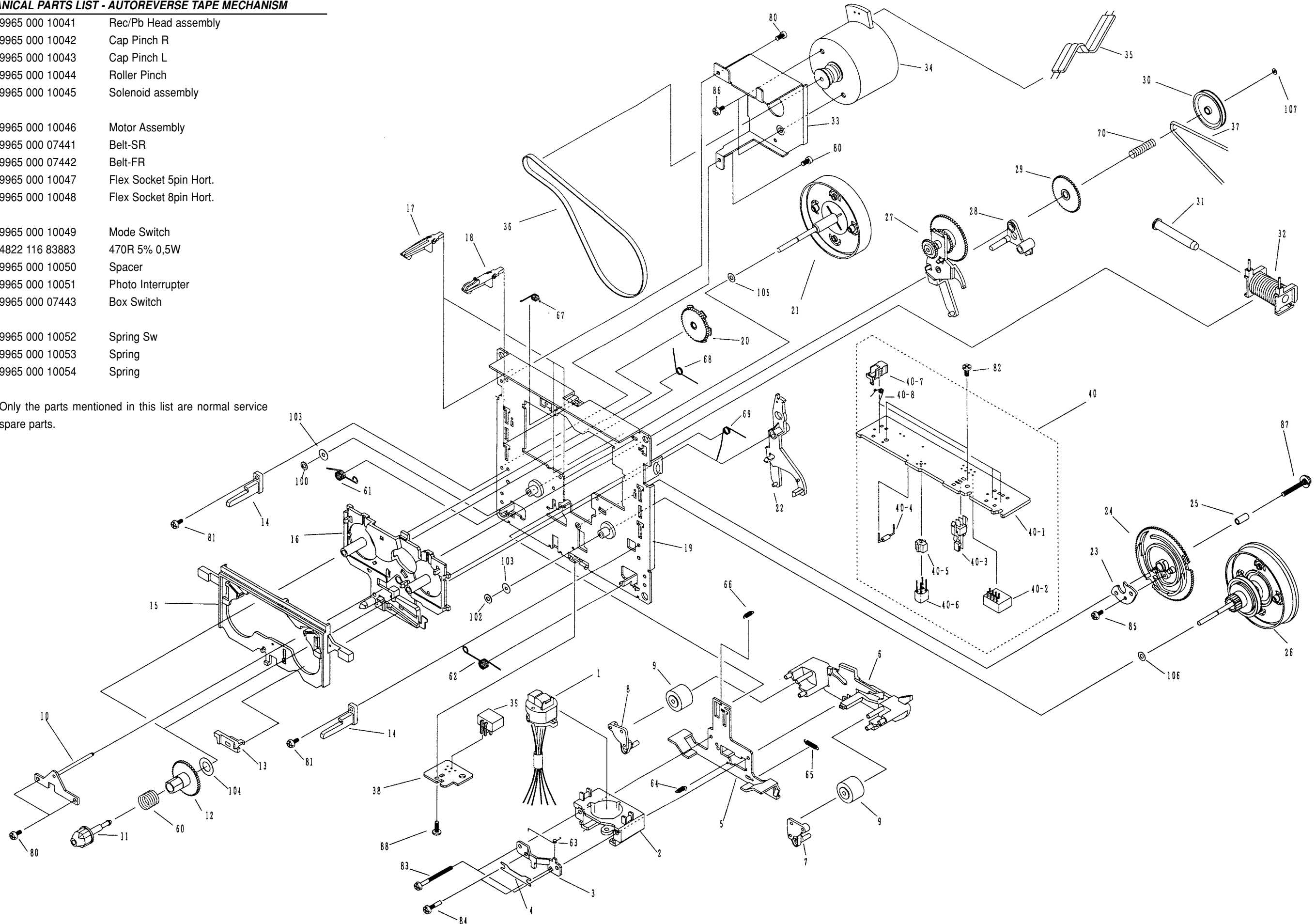
1701 D14	3786 I5
1703 A1	3789 I4
1706 A1	3790 D9
1710 F1	3791 G9
1760 A14	3792 F6
2621 A3	3793 F5
2622 A3	3794 F5
2623 A3	3795 F5
2625 C5	3796 E10
2701 D2	3797 C11
2702 E3	3800 G11
2703 E13	4736 D5
2704 F12	4737 D5
2709 E7	5701 G2
2710 G7	5703 I1
2711 D9	6612 A10
2712 I8	6770 H2
2713 D9	6771 H2
2714 I8	6772 H1
2715 D8	6773 G2
2716 H8	6774 G3
2717 D5	6776 I4
2718 E5	6777 H3
2719 F4	6778 H5
2720 F4	7610 B5
2721 D7	7612 A9
2722 H7	7614 A10
2723 D7	7618 B9
2727 D3	7620 B10
2728 E3	7624 C11
2729 E8	7780 I4
2730 H8	7781 I3
2731 E9	7782 H2
2732 G2	7783 I2
2743 I1	7784 G3
2747 D13	7786 G2
2761 F10	7788 G14
2768 H13	7789 G12
2769 E12	7792 F6
2770 F11	7793 F4
2780 I4	7794 F4
2781 I3	
2782 I2	
2784 I1	
2785 I2	
2786 G1	
2787 H3	
2788 E13	
2789 E9	
2790 G8	
2791 E8	
2793 F8	
2794 G8	
2795 G5	
2796 G9	
2797 G9	
2798 E9	
2799 F10	
3607 A11	
3608 B10	
3609 A11	
3610 B11	
3611 A10	
3612 B11	
3614 C11	
3624 A9	
3626 A10	
3628 A9	
3630 A9	
3678 B8	
3680 B9	
3686 C11	
3709 D8	
3710 I8	
3711 E7	
3712 G7	
3717 D5	
3718 E5	
3719 E4	
3720 E5	
3721 E4	
3722 E4	
3723 D3	
3724 E3	
3733 E13	
3734 F13	
3735 E13	
3736 E13	
3737 G13	
3738 G12	
3739 G13	
3740 G14	
3743 E12	
3744 F11	
3745 D12	
3746 D11	
3749 D2	
3750 E2	
3762 H2	
3764 F10	
3768 D13	
3769 H5	
3770 I2	
3771 I3	
3772 I3	
3774 H3	
3775 I3	
3776 I2	
3777 I2	
3778 H1	
3779 G3	
3780 G2	
3781 G2	

# AUTOREVERSE (AR) TAPE MECHANISM

## MECHANICAL PARTS LIST - AUTOREVERSE TAPE MECHANISM

1	9965 000 10041	Rec/Pb Head assembly
7	9965 000 10042	Cap Pinch R
8	9965 000 10043	Cap Pinch L
9	9965 000 10044	Roller Pinch
32	9965 000 10045	Solenoid assembly
34	9965 000 10046	Motor Assembly
36	9965 000 07441	Belt-SR
37	9965 000 07442	Belt-FR
39	9965 000 10047	Flex Socket 5pin Hort.
40-2	9965 000 10048	Flex Socket 8pin Hort.
40-3	9965 000 10049	Mode Switch
40-4	4822 116 83883	470R 5% 0,5W
40-5	9965 000 10050	Spacer
40-6	9965 000 10051	Photo Interrupter
40-7	9965 000 07443	Box Switch
40-8	9965 000 10052	Spring Sw
61	9965 000 10053	Spring
62	9965 000 10054	Spring

Note: Only the parts mentioned in this list are normal service spare parts.

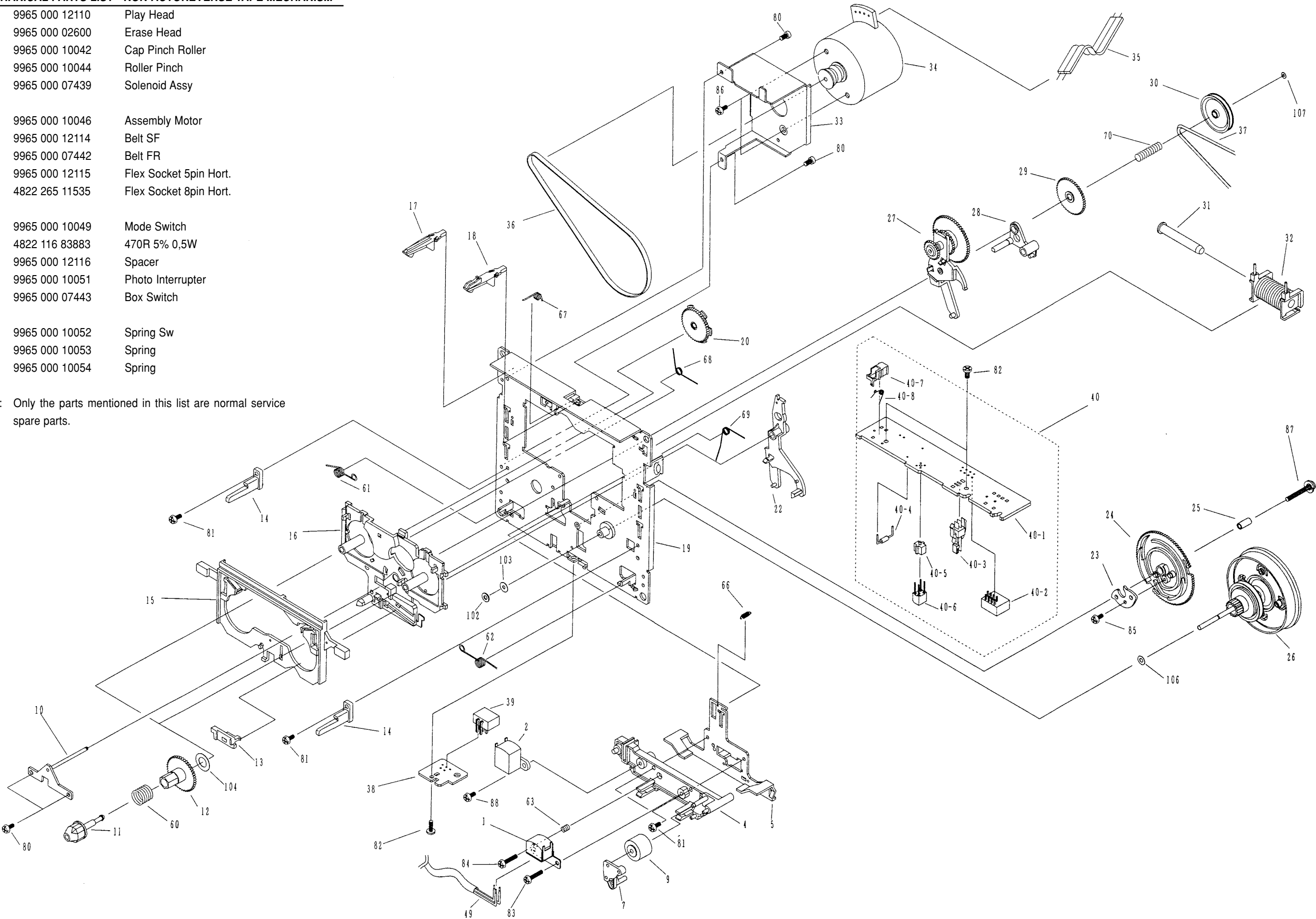


NON-AUTOREVERSE (NAR) TAPE MECHANISM

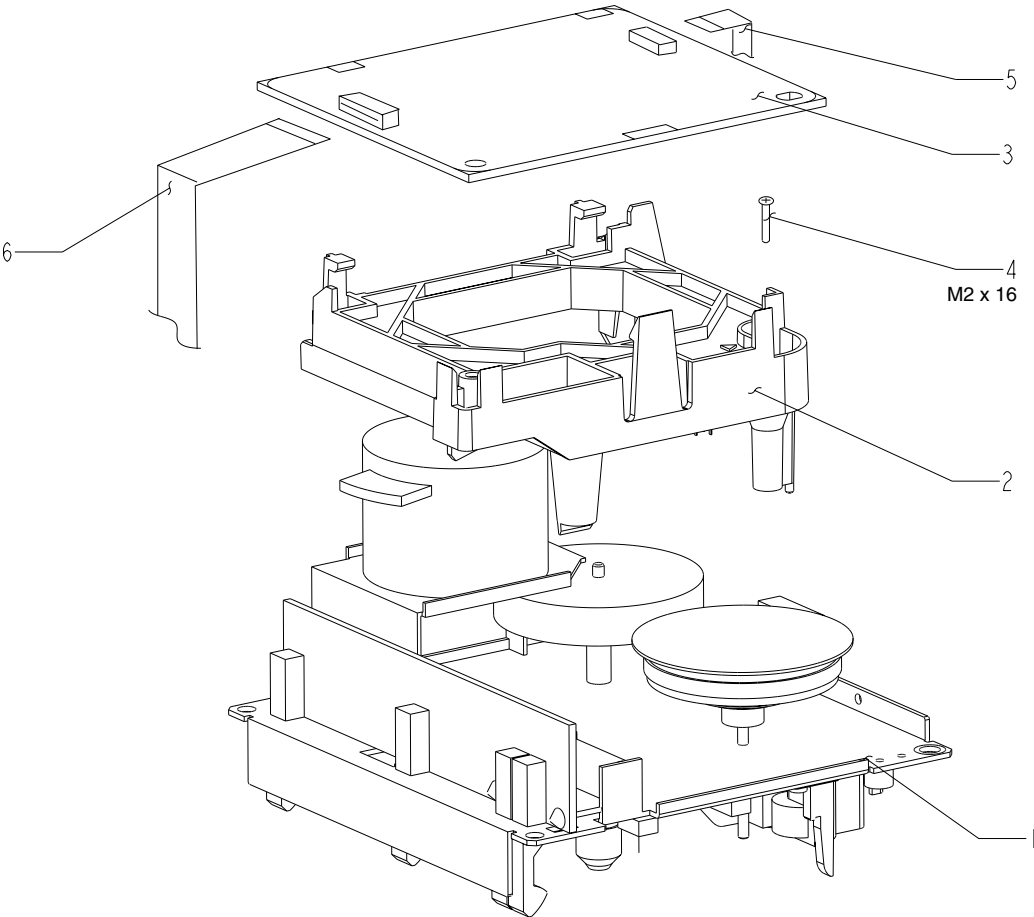
MECHANICAL PARTS LIST - NON-AUTOREVERSE TAPE MECHANISM

1	9965 000 12110	Play Head
2	9965 000 02600	Erase Head
7	9965 000 10042	Cap Pinch Roller
9	9965 000 10044	Roller Pinch
32	9965 000 07439	Solenoid Assy
34	9965 000 10046	Assembly Motor
36	9965 000 12114	Belt SF
37	9965 000 07442	Belt FR
39	9965 000 12115	Flex Socket 5pin Hort.
40-2	4822 265 11535	Flex Socket 8pin Hort.
40-3	9965 000 10049	Mode Switch
40-4	4822 116 83883	470R 5% 0,5W
40-5	9965 000 12116	Spacer
40-6	9965 000 10051	Photo Interrupter
40-7	9965 000 07443	Box Switch
40-8	9965 000 10052	Spring Sw
61	9965 000 10053	Spring
62	9965 000 10054	Spring

Note: Only the parts mentioned in this list are normal service spare parts.



TAPE MODULE EXPLODED VIEW



ETF8 SD Exploded view .....78730 dd wk204

MECHANICAL PARTS LIST - TAPE MODULE

1	3139 118 78740	AR Tape Mech. CRL4438
1	3139 118 79220	Non-AR Tape Mech. CFL4217
5	3139 110 35580	Flex Cable 5pin 40mm AD
6	3139 110 35590	Flex Cable 8pin 48mm AD

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS LIST - ETF8 BOARD

MISCELLANEOUS

1701	4822 267 10953	Flex Socket 7pin Vert.
1706	4822 267 10953	Flex Socket 7pin Vert.
1710	4822 267 10958	Flex Socket 5pin Hort.
1760	4822 265 11535	Flex Socket 8pin Hort.

CAPACITORS

2621	5322 126 11578	1nF 10% 50V
2621	5322 122 31647	1nF 10% 63V
2622	4822 126 13881	470pF 5% 50V
2622	5322 122 32268	470pF 5% 50V
2623	4822 126 13881	470pF 5% 50V
2623	5322 122 32268	470pF 5% 50V
2625	4822 126 14305	100nF 10% 16V
2625	2238 586 59812	100nF +80/-20% 50V
2701	4822 122 31765	100pF 2% 63V
2701	5322 122 32531	100pF 5% 50V
2702	4822 122 31765	100pF 2% 63V
2702	5322 122 32531	100pF 5% 50V
2703	4822 122 31765	100pF 2% 63V
2703	5322 122 32531	100pF 5% 50V
2704	4822 122 31765	100pF 2% 63V
2704	5322 122 32531	100pF 5% 50V
2709	5322 126 11578	1nF 10% 50V
2710	5322 126 11578	1nF 10% 50V
2711	4822 122 31765	100pF 2% 63V
2711	5322 122 32531	100pF 5% 50V
2712	4822 122 31765	100pF 2% 63V
2712	5322 122 32531	100pF 5% 50V
2713	5322 121 42386	100nF 5% 63V
2714	5322 121 42386	100nF 5% 63V
2715	4822 124 41584	100uF 20% 10V
2716	4822 124 41584	100uF 20% 10V
2717	3198 017 31530	15nF 50V
2717	4822 126 13188	15nF 5% 63V
2718	3198 017 31530	15nF 50V
2718	4822 126 13188	15nF 5% 63V
2721	3198 017 41050	1uF 10V
2721	4822 126 14043	1uF +80/-20% 16V
2722	3198 017 41050	1uF 10V
2722	4822 126 14043	1uF +80/-20% 16V
2723	4822 126 14238	2,2nF 50V
2724	4822 126 14238	2,2nF 50V
2725	4822 126 13883	220pF 5% 50V
2727	4822 126 14238	2,2nF 50V
2728	4822 126 14238	2,2nF 50V
2729	4822 126 14494	22nF 10% 25V
2729	2238 916 15641	22nF 10% 25V
2730	4822 126 14494	22nF 10% 25V
2730	2238 916 15641	22nF 10% 25V
2731	5322 126 11578	1nF 10% 50V
2731	5322 122 31647	1nF 10% 63V
2732	3198 017 41050	1uF 10V

2732	4822 126 14043	1uF +80/-20% 16V
2743	4822 126 14494	22nF 10% 25V
2743	2238 916 15641	22nF 10% 25V
2747	4822 126 14549	33nF 16V
2761	4822 124 40196	220uF 20% 16V
2768	4822 124 40756	1uF 20% 100V
2769	4822 126 14238	2,2nF 50V
2770	4822 126 14238	2,2nF 50V
2780	4822 124 81151	22uF 50V
2781	5322 126 11583	10nF 10% 50V
2781	4822 122 33177	10nF 20% 50V
2782	4822 126 13193	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 21913	1uF 20% 63V
2786	4822 122 31765	100pF 2% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 14549	33nF 16V
2788	4822 126 14494	22nF 10% 25V
2788	2238 916 15641	22nF 10% 25V
2789	4822 126 14549	33nF 16V
2790	4822 126 14247	1,5nF 50V
2791	4822 126 14247	1,5nF 50V
2793	4822 126 13883	220pF 5% 50V
2794	4822 126 13883	220pF 5% 50V
2796	4822 124 40433	47uF 20% 25V
2797	4822 124 81151	22uF 50V
2798	4822 124 21732	10uF 20% 25V
2799	4822 126 14305	100nF 10% 16V
2799	2238 586 59812	100nF +80/-20% 50V

RESISTORS

3607	4822 051 30222	2k2 5% 0,062W
3607	4822 117 11449	2k2 5% 0,1W
3608	4822 051 30273	27k 5% 0,062W
3609	4822 051 30222	2k2 5% 0,062W
3609	4822 117 11449	2k2 5% 0,1W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 051 30222	2k2 5% 0,062W
3611	4822 117 11449	2k2 5% 0,1W
3612	4822 051 30563	56k 5% 0,062W
3614	4822 051 30273	27k 5% 0,062W
3624	4822 117 13632	100k 1% 0,062W
3624	4822 117 10837	100k 1% 0,1W
3626	4822 051 30102	1k 5% 0,062W
3628	4822 117 13632	100k 1% 0,062W
3628	4822 117 10837	100k 1% 0,1W
3630	4822 051 30471	470R 5% 0,062W
3678	4822 117 12925	47k 1% 0,063W
3680	4822 117 12925	47k 1% 0,063W
3686	4822 117 13632	100k 1% 0,062W
3686	4822 117 10837	100k 1% 0,1W
3709	4822 051 30339	33R 5% 0,062W

AR  
AR

ELECTRICAL PARTS LIST - ETF8 BOARD

RESISTORS

3710	4822 051 30339	33R 5% 0,062W	
3711	4822 051 30101	100R 5% 0,062W	
3712	4822 051 30101	100R 5% 0,062W	
3717	4822 117 11817	1k2 1% 1/16W	AR
3717	4822 051 20122	1k2 5% 0,1W	AR
3718	4822 117 11817	1k2 1% 1/16W	AR
3718	4822 051 20122	1k2 5% 0,1W	AR
3723	4822 051 30183	18k 5% 0,062W	AR
3723	4822 051 30223	22k 5% 0,062W	Non-AR
3724	4822 051 30183	18k 5% 0,062W	AR
3724	4822 051 30223	22k 5% 0,062W	Non-AR
3733	4822 051 30273	27k 5% 0,062W	
3734	4822 051 30273	27k 5% 0,062W	
3735	4822 051 30223	22k 5% 0,062W	
3735	4822 051 20223	22k 5% 0,1W	
3736	4822 051 30223	22k 5% 0,062W	
3736	4822 051 20223	22k 5% 0,1W	
3737	4822 051 30102	1k 5% 0,062W	
3737	4822 051 10102	1k 2% 0,25W	
3738	4822 051 30102	1k 5% 0,062W	
3738	4822 051 10102	1k 2% 0,25W	
3739	4822 117 12925	47k 1% 0,063W	
3740	4822 117 12925	47k 1% 0,063W	
3743	4822 051 30563	56k 5% 0,062W	
3744	4822 051 30563	56k 5% 0,062W	
3745	4822 117 11817	1k2 1% 1/16W	
3745	4822 051 20122	1k2 5% 0,1W	
3746	4822 117 11817	1k2 1% 1/16W	
3746	4822 051 20122	1k2 5% 0,1W	
3749	4822 051 30121	120R 5% 0,062W	
3749	4822 051 20121	120R 5% 0,1W	
3750	4822 051 30121	120R 5% 0,062W	
3750	4822 051 20121	120R 5% 0,1W	
3762	4822 117 12968	820R 5% 0,62W	
3764	4822 051 30181	180R 5% 0,062W	
3764	4822 117 11448	180R 1% 0,1W	
3768	4822 051 30103	10k 5% 0,062W	
3768	4822 117 10833	10k 1% 0,1W	
3769	4822 051 30223	22k 5% 0,062W	AR
3769	4822 051 30183	18k 5% 0,062W	Non-AR
3770	4822 051 30152	1k5 5% 0,062W	
3771	4822 117 11817	1k2 1% 1/16W	
3771	4822 051 20122	1k2 5% 0,1W	
3772	4822 051 30153	15k 5% 0,062W	AR
3772	4822 051 30123	12k 5% 0,062W	Non-AR
3774	4822 051 30183	18k 5% 0,062W	
3775	4822 117 13608	4,7R 5% 0,063W	
3776	4822 051 30682	6k8 5% 0,062W	
3777	4822 051 30151	150R 5% 0,062W	
3777	4822 117 10353	150R 1% 0,1W	
3778	4822 052 10688	6R8 5% 0,33W	
3779	4822 051 30334	330k 5% 0,062W	

3780	4822 051 30105	1M 5% 0,062W	
3780	4822 051 20105	1M 5% 0,1W	
3781	4822 051 30475	4M7 5% 0,062W	
3786	4822 051 30223	22k 5% 0,062W	
3786	4822 051 20223	22k 5% 0,1W	
3789	4822 117 12925	47k 1% 0,063W	
3790	4822 051 30223	22k 5% 0,062W	
3790	4822 051 20223	22k 5% 0,1W	
3791	4822 051 30273	27k 5% 0,062W	
3796	4822 051 30475	4M7 5% 0,062W	
3797	4822 051 30563	56k 5% 0,062W	
3800	4822 051 30223	22k 5% 0,062W	
3800	4822 051 20223	22k 5% 0,1W	
4701	4822 051 30008	0R Jumper 0603	
4702	4822 051 30008	0R Jumper 0603	
4705	4822 051 30008	0R Jumper 0603	
4707	4822 051 30008	0R Jumper 0603	
4708	4822 051 30008	0R Jumper 0603	
4709	4822 051 30008	0R Jumper 0603	
4710	4822 051 30008	0R Jumper 0603	
4711	4822 051 30008	0R Jumper 0603	
4712	4822 051 30008	0R Jumper 0603	
4718	4822 051 30008	0R Jumper 0603	
4719	4822 051 30008	0R Jumper 0603	
4720	4822 051 30008	0R Jumper 0603	
4721	4822 051 30008	0R Jumper 0603	
4723	4822 051 30008	0R Jumper 0603	
4725	4822 051 30008	0R Jumper 0603	
4726	4822 051 30008	0R Jumper 0603	
4727	4822 051 30008	0R Jumper 0603	
4729	4822 051 30008	0R Jumper 0603	
4730	4822 051 30008	0R Jumper 0603	
4731	4822 051 30008	0R Jumper 0603	
4732	4822 051 30008	0R Jumper 0603	
4733	4822 051 30008	0R Jumper 0603	
4734	4822 051 30008	0R Jumper 0603	
4735	4822 051 30008	0R Jumper 0603	
4736	4822 051 30008	0R Jumper 0603	Non-AR
4737	4822 051 30008	0R Jumper 0603	Non-AR
4738	4822 051 30008	0R Jumper 0603	
4739	4822 051 30008	0R Jumper 0603	
4741	4822 051 30008	0R Jumper 0603	
4746	4822 051 30008	0R Jumper 0603	
4747	4822 051 30008	0R Jumper 0603	

COILS & FILTERS

5701	4822 157 62552	Coil 2,2uH 5%
5703	4822 156 20946	Osc Coil 100kHz

DIODES

6612	4822 130 31878	1N4003G
6770	4822 130 30621	1N4148

ELECTRICAL PARTS LIST - ETF8 BOARD

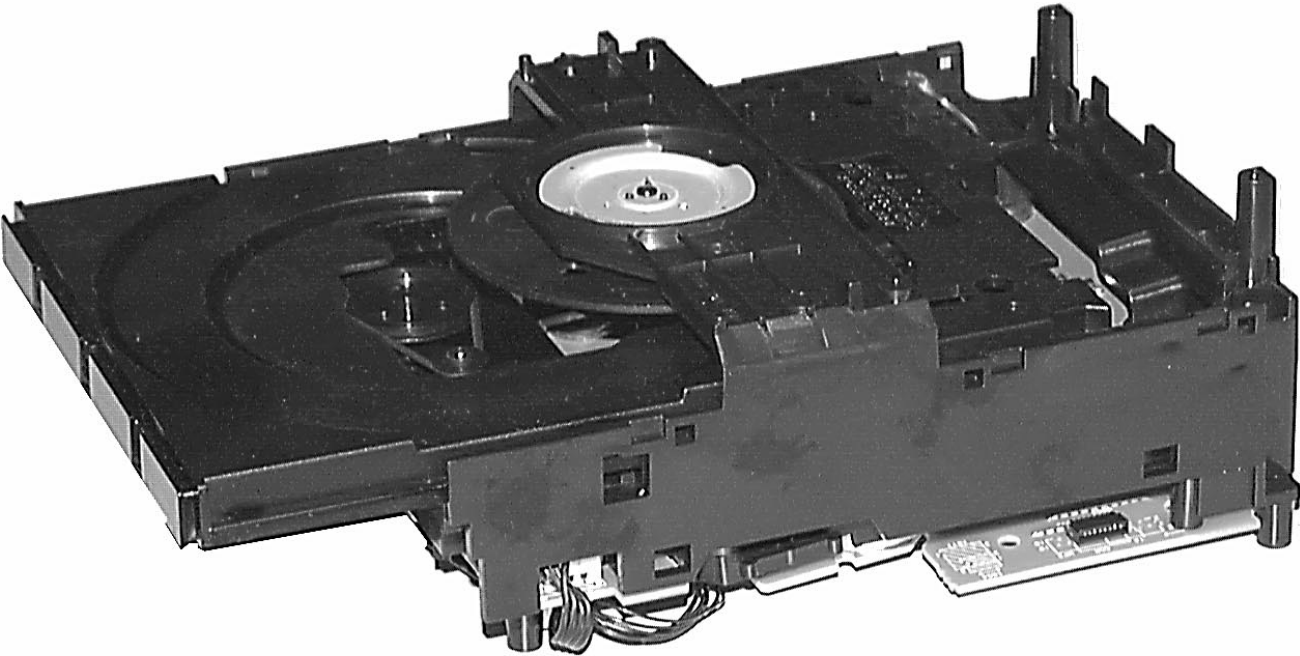
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-B8V2
6778	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUIT

7610	5322 209 11306	HEF4094BT
7612	4822 130 11201	PMBT2907
7614	4822 130 11201	PMBT2907
7618	5322 130 60159	BC847B
7620	5322 130 60159	BC847B
7624	5322 130 60159	BC847B
7720	9322 167 09668	AN17150ATA
7780	5322 130 60159	BC847B
7781	4822 130 42804	BC817-25
7782	4822 130 44568	BC557B
7783	5322 130 60159	BC847B
7784	4822 130 60373	BC857B
7786	9340 052 70126	FET SIG J112
7788	5322 130 60159	BC847B
7789	5322 130 60159	BC847B
7790	5322 130 60159	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.





**Universal Loader**  
**(Single Disc Tray Loader)**

MP3 version, ICD03 PHONIC Layout stage .3

This document describes 2 versions, the version with the Mitsumi CD drive **MCD2** and the version with the Sanyo CD drive **DA12**.  
The CD drive used in a specific application is stated on the type plate, located on one of the side walls of the changer module.



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**Service hints**

*In case of symptom „skipping tracks“ perform following actions:*

**1. VERIFY THE COMPLAINT**

**PLAYABILITY CHECK**

use CD-RW Printed Audio Disk . . . . .7104 099 96611  
TR 3 (Fingerprint)  
TR 8 (600µ black dot) **maximum at 01:00**

- playback of these two tracks without audible disturbance  
playing time for: Fingerprint ≥10seconds  
Black dot from 00:50 to 01:10
- jump forward/backward (search) within a reasonable time

**2. CLEAN THE LENS**

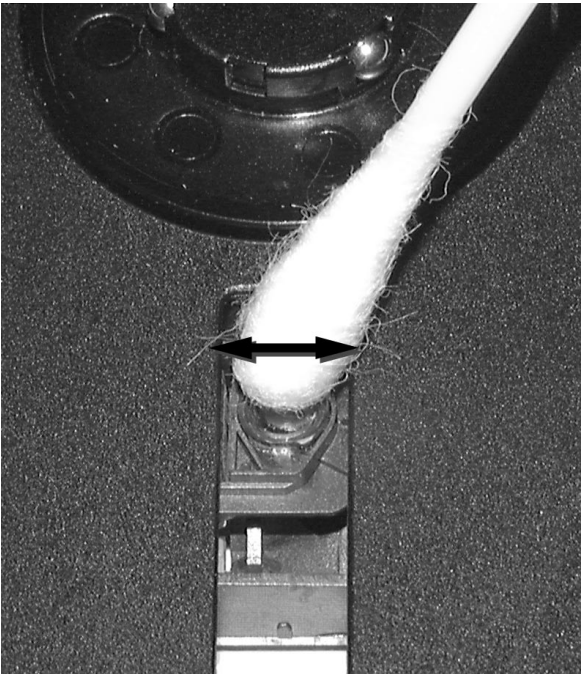
**CD DRIVE – LENS CLEANING**

Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it in order to avoid that little particles make scratches on the lens.

Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use “Cleaning Solvent B4”, available with codenumber 4822 389 10026.

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. It is advised to clean the lens gently (don't press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

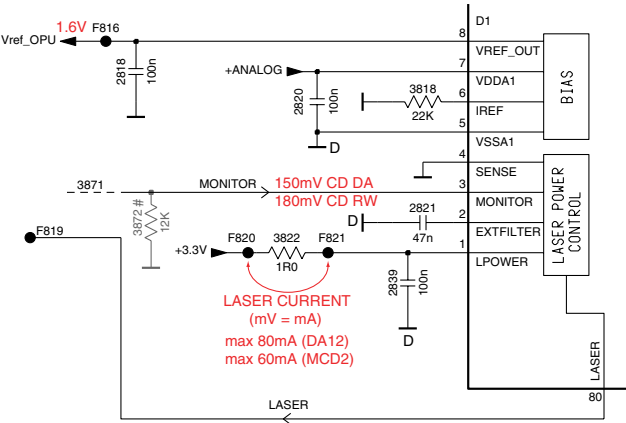
The direction of cleaning must be in the way as indicated in the picture below.



**3. MEASURE THE LASER CURRENT**

**CD DRIVE – LASER CURRENT MEASUREMENT**

The laser current can be measured as a voltage drop on resistor 3822. Typical value 50mV (MCD2 disc drive) respectively 55mV (DA12 disc drive).



If the value is higher than 60mV (MCD2 disc drive) respectively 80mV (DA12 disc drive) or the current increases just after switching the laser on - the laserdiode is most probably defective. In that case the CD drive has to be replaced.

**4. GENERAL HINTS**

Since the HF pre-amplifier is integrated into the new "CD18" signal processor the well-known eye pattern signal is not available as external signal and cannot be measured anymore. Also measuring the offset voltages is not necessary because the new signal processor contains an automatic offset compensation.

However the circuitry offers some new aspects for checking the system:

- the Monitor voltage shows if the sensitivity is set correctly (attention: ESD sensitive line!):  
CD DA: 150mV  
CD RW: 180mV
- the Focus search algorithm is divided into 4 steps:  
1<sup>st</sup> step: CD DA sensitivity  
2<sup>nd</sup> step: CD DA enforced sensitivity  
3<sup>rd</sup> step: CD RW sensitivity  
4<sup>th</sup> step: CD RW enforced sensitivity

The used sensitivity can be found out by either measuring the Monitor voltage or counting the up/down movements of the OPU until focus is found.  
e.g. when a normal CD DA is played back Monitor voltage should measure 150mV respectively Focus should be found within the first up/down movement of the OPU.

- In case a higher sensitivity setting can be observed than defined, there are following possible reasons:
- disc scratched or dirty
  - poor reflectivity of the disc - disc not conform standard
  - lens of the OPU dirty
  - laser power too low



CAUTION

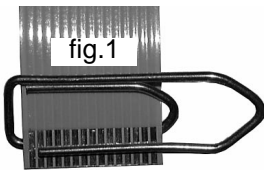
**CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE**

- **SWITCH OFF POWER SUPPLY**
- **ESD PROTECTION**

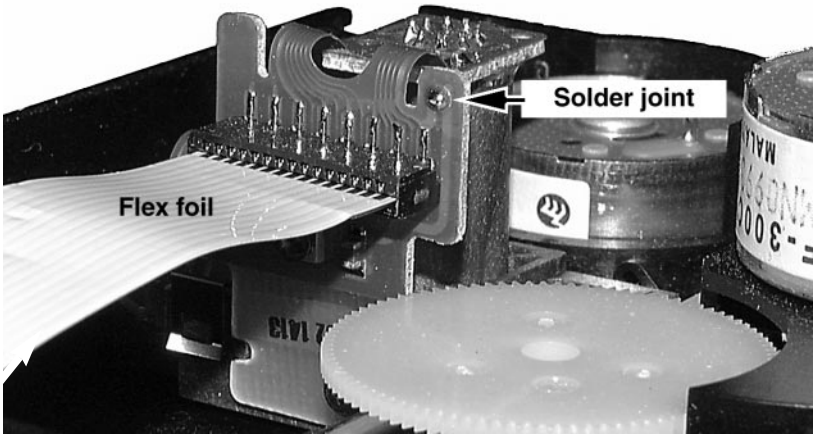
**ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.**

The following steps have to be done when replacing the CD mechanism:

1. Disconnect flexfoil cable from the old CD drive
2. Put a paperclip onto the flexfoil cable to short-circuit the contacts (fig.1)
3. Remove the old CD drive
4. Remove paperclip from the flexfoil cable and connect it to the new CD drive
5. Position the new CD drive on its studs
6. Remove solder joint from the Laser unit (see below)



**Attention:** The laser diode of this CD drive is protected against ESD by a solder joint which short-circuits the laser diode to ground.  
For proper functionality of the CD drive this solder joint must be removed **after** connecting the drive to the set.



Emergency open

- In case of a Supply fault, the drawer can be opened manually.
1. Remove the top cover of the set to get access to the CD Module.
  2. Proceed as shown in picture below.



Dismantling of Drawer

1. Open the drawer and release 2 catches as shown in fig. 2
2. Pull drawer out.

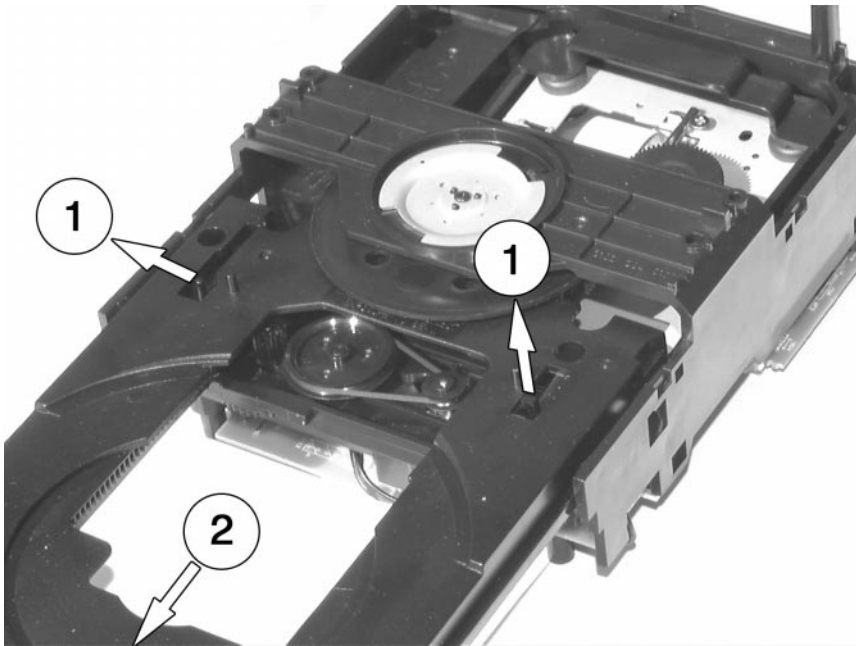
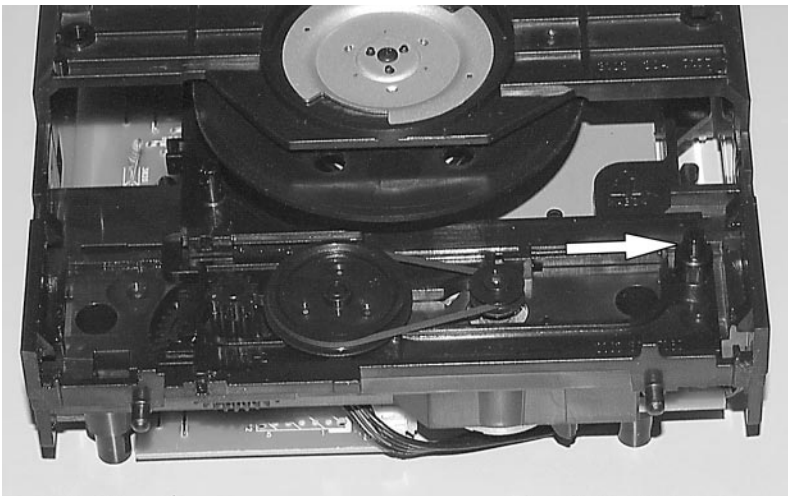


fig.2

Assembling of Drawer

1. Check if slider is on the right side → see picture below.
2. If necessary - move slider to the right end position first.
3. Insert the Drawer.





Abbreviations

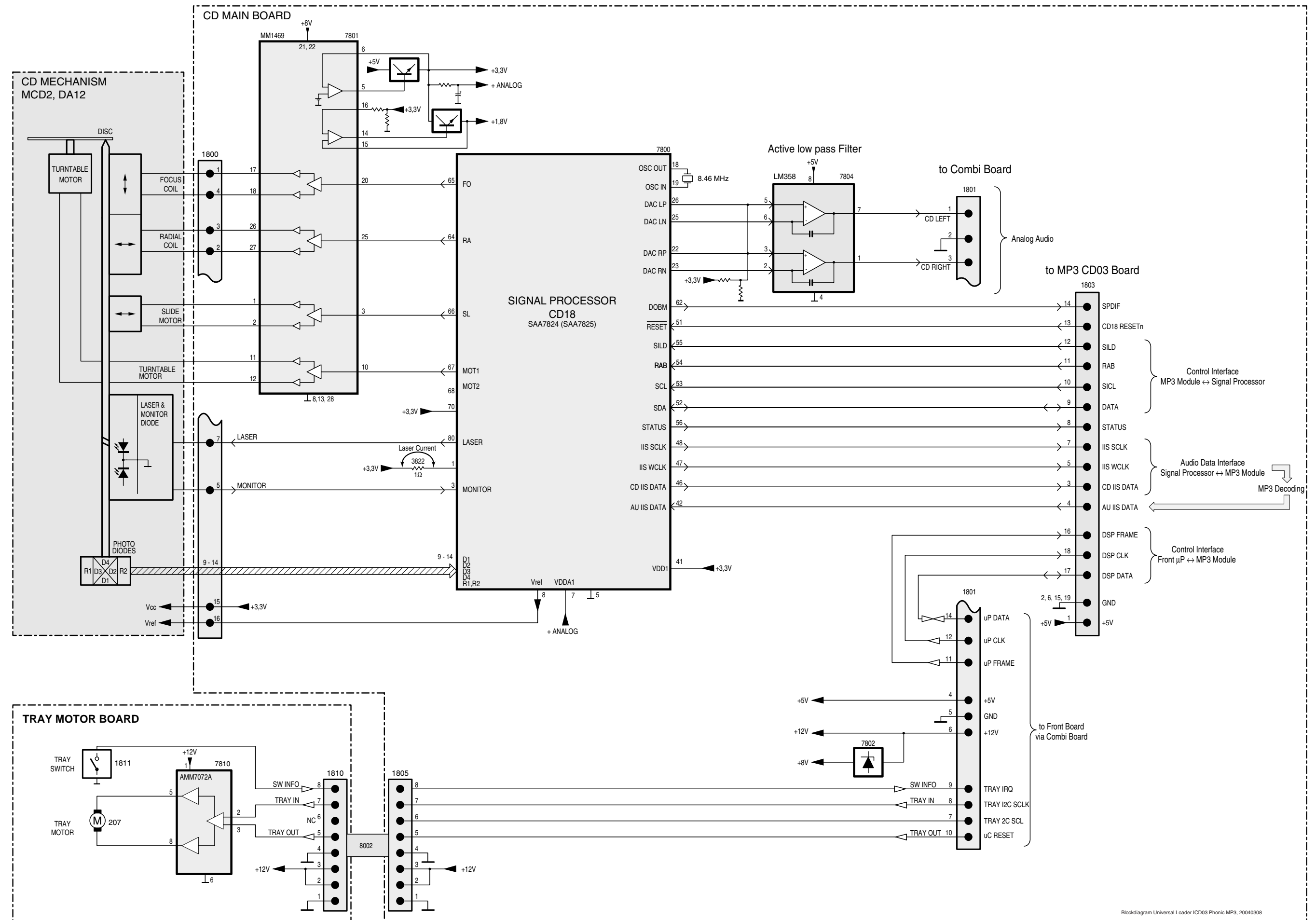
SIGNAL PROCESSOR (CD18) SAA7825

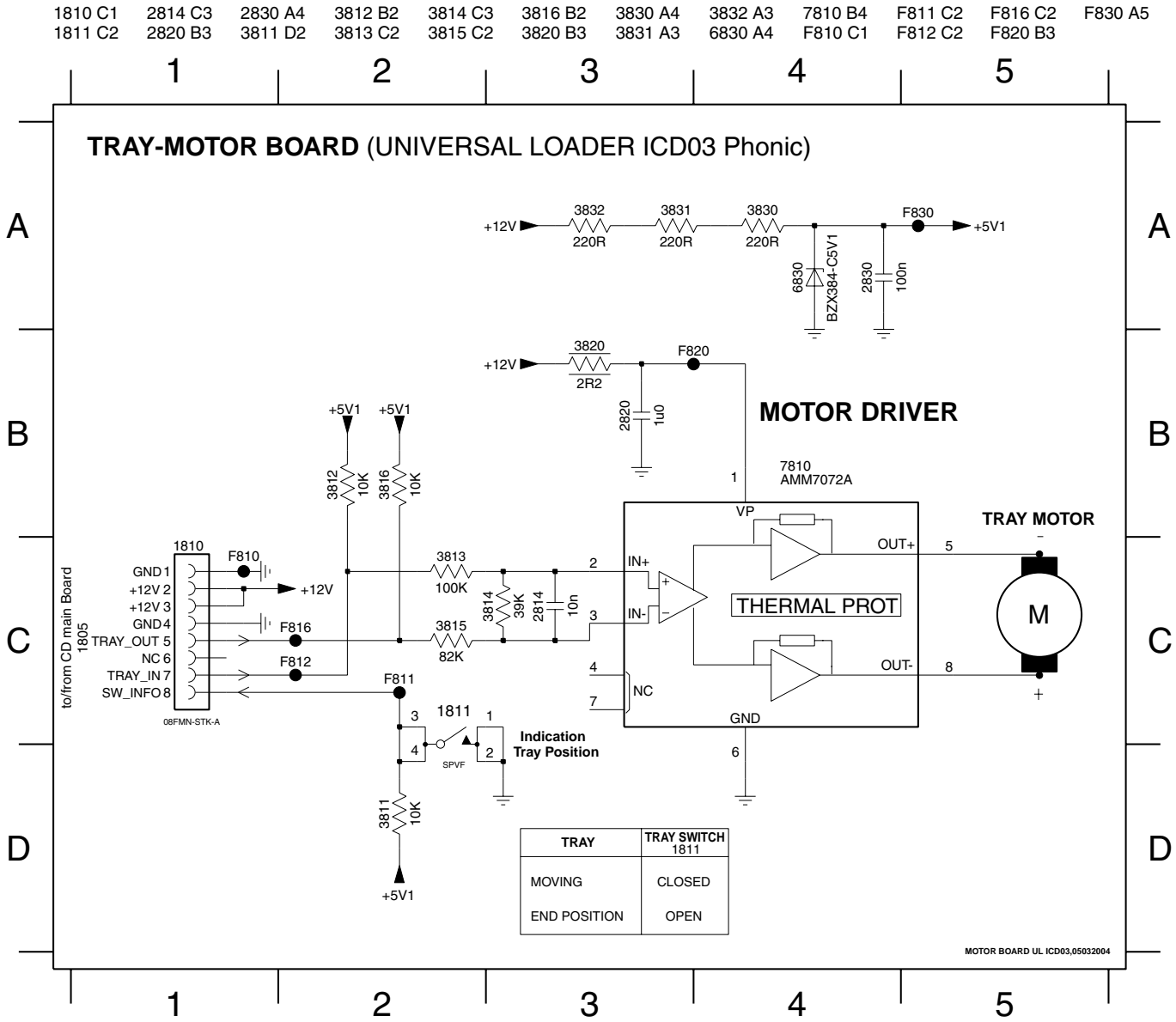
SYMBOL	PIN	I/O	DESCRIPTION
LFPOWER	1	I	laser power supply
EXFILTER	2	O	10 nF capacitor for laser start-up control
MONITOR	3	I	laser monitor diode
SENSE	4	I	OPU ground reference point for MONITOR measurement
V <sub>SSA1</sub>	5	SUP	analog ground 1
I <sub>REF</sub>	6	O	reference current output (22 kΩ resistor connected to analog ground)
V <sub>DDA1</sub>	7	SUP	analog supply voltage 1
V <sub>REFO</sub>	8	I/O	servo reference voltage
D1	9	I	diode voltage/current input (central diode signal input)
D2	10	I	diode voltage/current input (central diode signal input)
D3	11	I	diode voltage/current input (central diode signal input)
D4	12	I	diode voltage/current input (central diode signal input)
R1	13	I	diode voltage/current input (satellite diode signal input)
R2	14	I	diode voltage/current input (satellite diode signal input)
CSLICE	15	I/O	22 nF capacitor for adaptive HF data slicer
V <sub>DDA2</sub>	16	SUP	analog supply voltage 2
V <sub>SSA2</sub>	17	SUP	analog ground 2
OSCOUT	18	O	crystal/resonator output
OSCIN	19	I	crystal/resonator input
V <sub>SSA3</sub>	20	SUP	analog ground 3
DACGND	21	I	audio DAC ground
DACRP	22	O	audio DAC right channel differential positive output
DACRN	23	O	audio DAC right channel differential negative output
DACV <sub>ref</sub>	24	I/O	audio DAC decoupling point (10 μF or 100 nF to ground
DACLN	25	O	audio DAC left channel differential negative output
DACLP	26	O	audio DAC left channel differential positive output
DACV <sub>pos</sub>	27	I	audio DAC positive supply voltage
BUFV <sub>pos</sub>	28	I	audio buffer positive supply voltage
BUFINR	29	I	audio buffer right input
BUFOUTR	30	O	audio buffer right output
BUFOUTL	31	O	audio buffer left output
BUFINL	32	I	audio buffer left input
BUFGND	33	I	audio buffer ground
LKILL	34	O	KILL output for left channel (configurable as open-drain)
RKILL	35	O	KILL output for right channel (configurable as open-drain)
CDTRDY	36	O	CD text output to microcontroller ready ⚡g
CDTDATA	37	O	CD text output data to microcontroller
CDTCLK	38	I	CD text microcontroller clock input
CFLAG	39	O	correction ⚡g output (open-drain)
V <sub>SSD1</sub>	40	SUP	digital ground 1

SYMBOL	PIN	I/O	DESCRIPTION
V <sub>DDD1</sub>	41	SUP	digital supply voltage 1
SDI	42	I	serial data input (loopback)
WCLI	43	I	word clock input (loopback)
SCLI	44	I	serial bit clock input (loopback)
EF	45	O	C2 error ⚡g output
DATA	46	O	serial data output
WCLK	47	O	word clock output
SCLK	48	O	serial clock output
CLK16	49	O	16 MHz clock output
CLK4/12	50	O	configurable 4 MHz or 12 MHz clock output
RESET	51	I	power-on reset input (active LOW)
SDA	52	I/O	microcontroller interface data input/output (open-drain)
SCL	53	I	microcontroller interface clock input
RAB	54	I	microcontroller interface R/W and load control input (4-wire)
SILD	55	I	microcontroller interface R/W and load control input (4-wire)
STATUS	56	O	servo interrupt request line/decoder status register/DC offset value readback output
RCK	57	I	subcode clock input
SUB	58	O	P to W subcode output
SFSY	59	O	subcode frame sync output
SBSY	60	O	subcode block sync output
V <sub>SSD2</sub>	61	SUP	digital ground 2
DOBM	62	O	bi-phase mark output (externally buffered)
V <sub>DDD2</sub>	63	SUP	digital supply voltage 2
RA	64	O	radial actuator output
FO	65	O	focus actuator output
SL	66	O	sledge actuator output
MOTO1	67	O	motor output 1 output
MOTO2	68	O	motor output 2 output
V <sub>SSD3</sub>	69	SUP	digital ground 3
V <sub>DDD3</sub>	70	SUP	digital supply voltage 3
V1	71	I	versatile pin 1 input
V2	72	I	versatile pin 2 input
V3	73	O	versatile pin 3 output
V4	74	O	versatile pin 4 output
V5	75	O	versatile pin 5 output
TEST1	76	I	test pin 1 input
TEST2	77	I	test pin 2 input
TEST3	78	I	test pin 3 input
TEST4	79	I	test pin 4 input
LASER	80	O	laser drive output

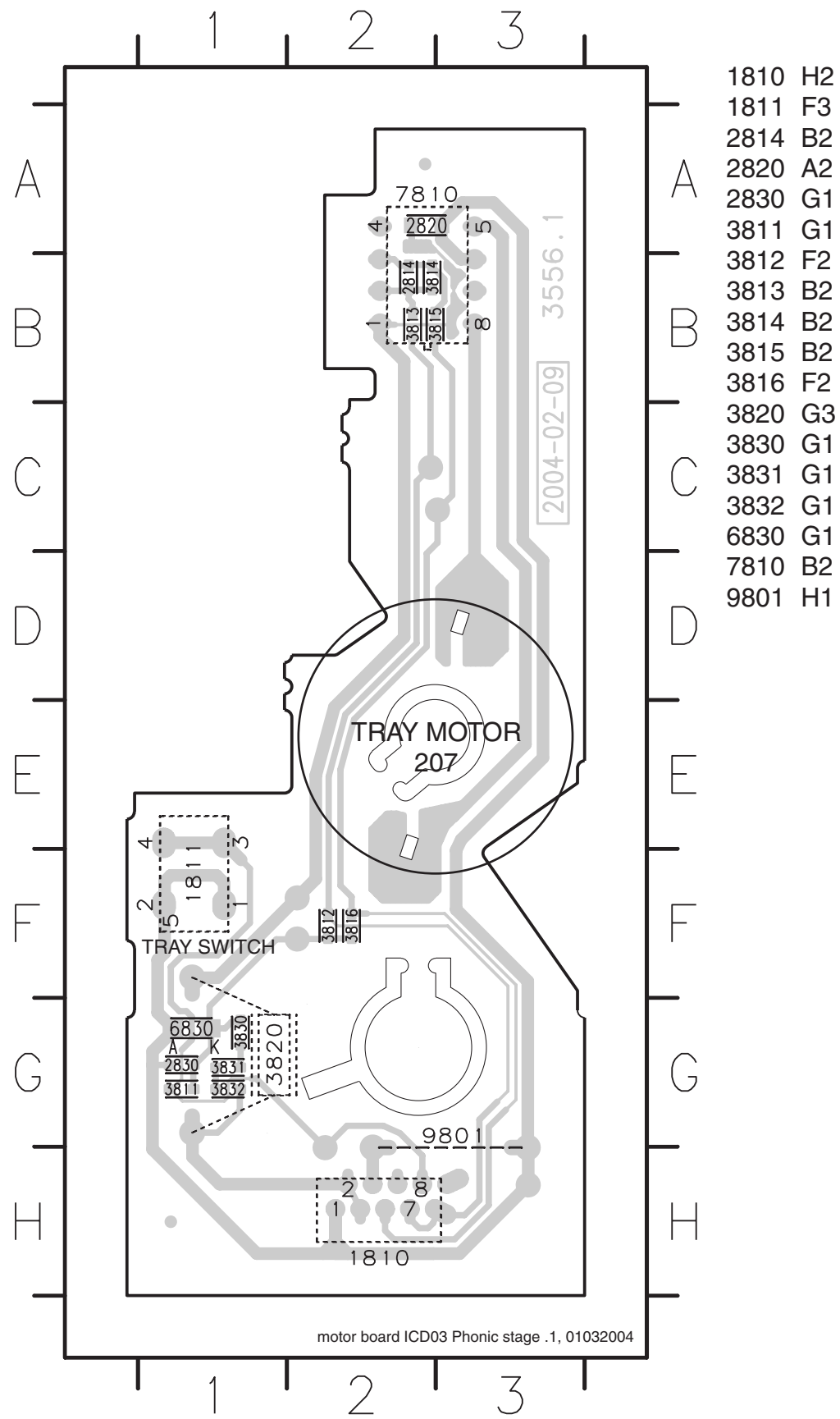
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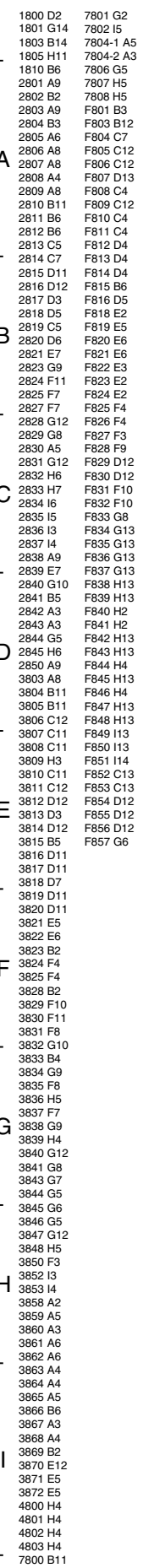
## Universal Loader / ICD03 PhonIC MP3





**TRAY MOTOR BOARD / copper side view**







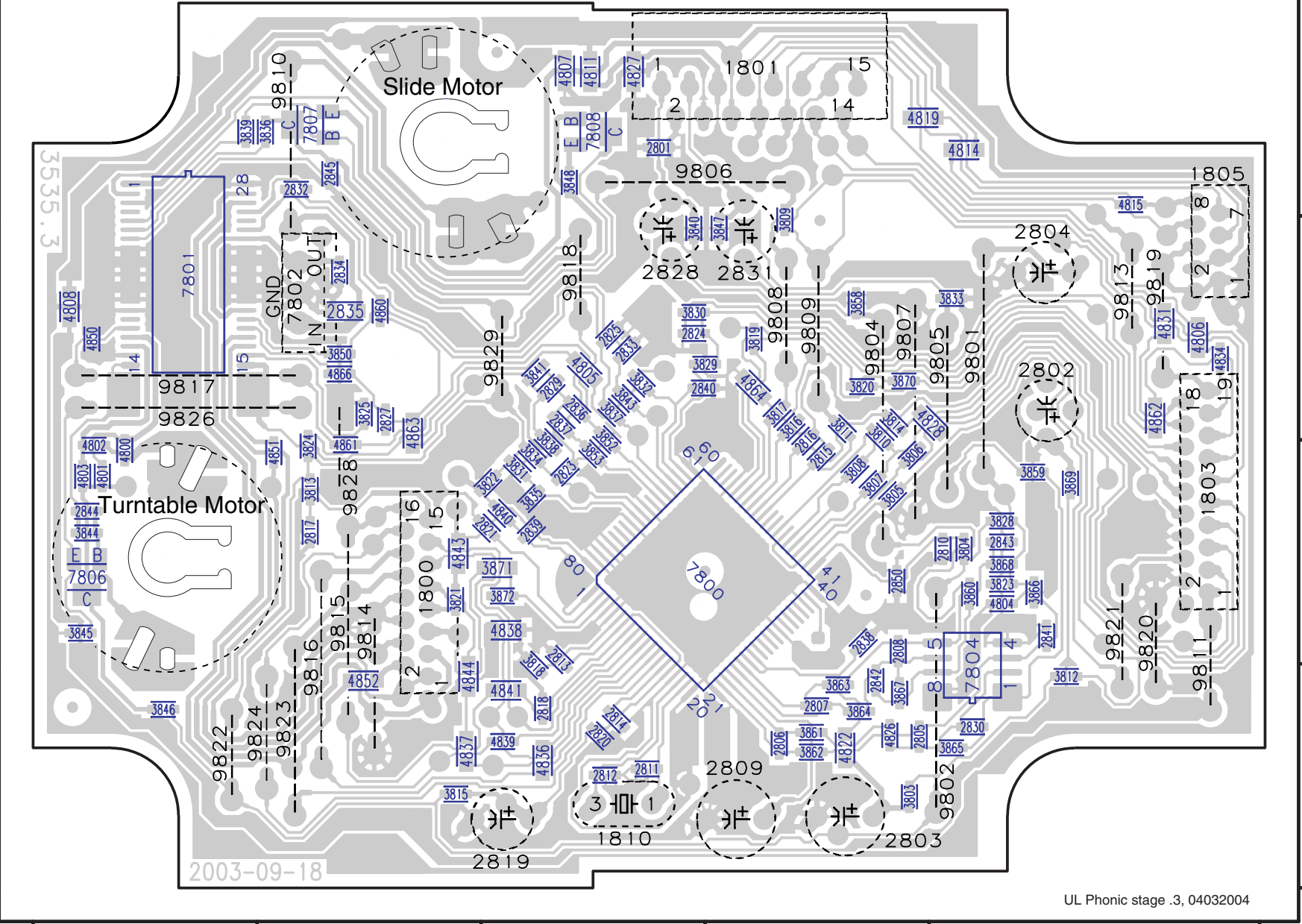
WIRED  
COMPONENTS

SURFACE MOUNTED COMPONENTS

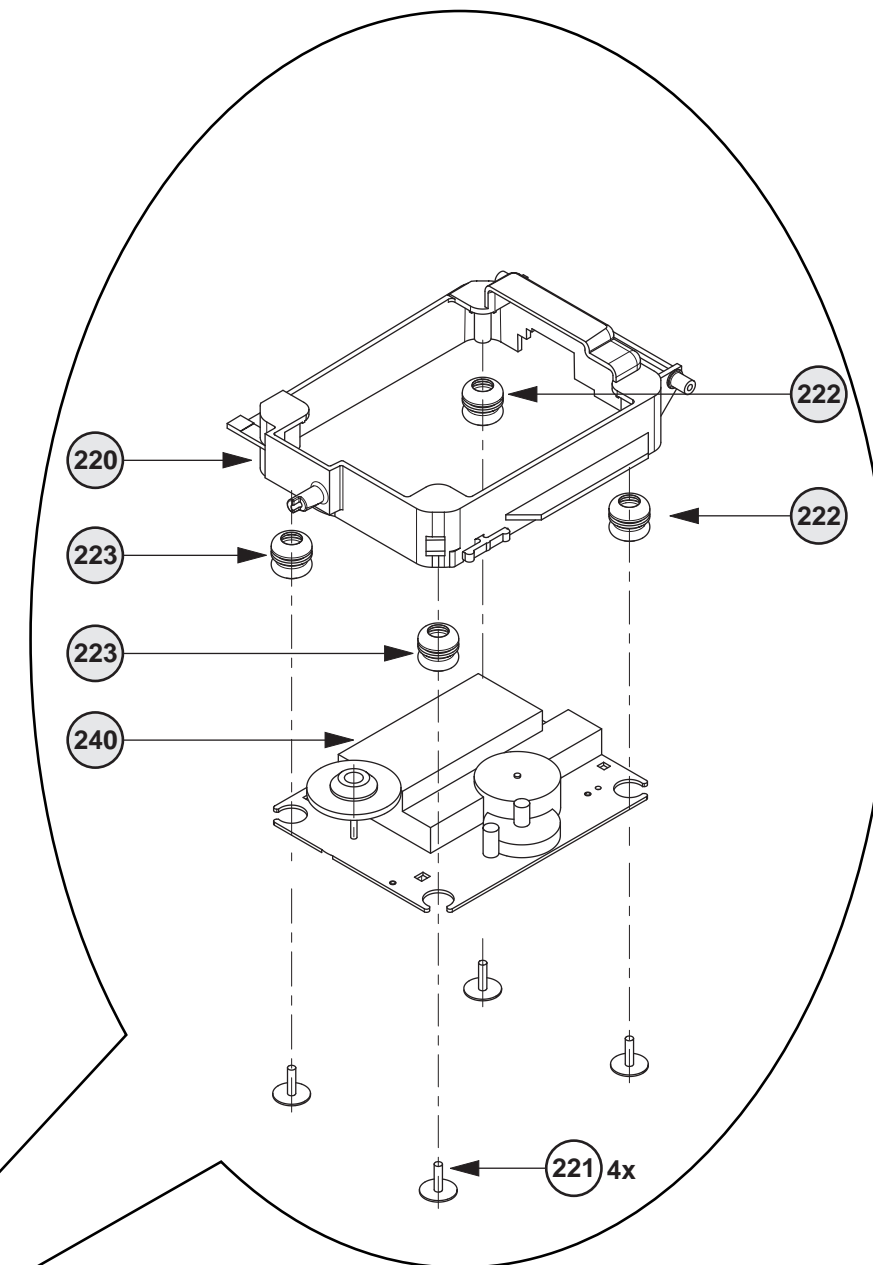
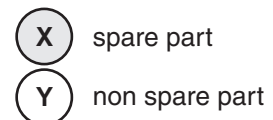
- 1800 C2
- 1801 A4
- 1803 C5
- 1805 B5
- 1810 D3
- 2802 B5
- 2803 D4
- 2804 B5
- 2809 D4
- 2819 D3
- 2828 B3
- 2831 B4
- 7802 B2
- 9801 B5
- 9802 D5
- 9804 B4
- 9805 B5
- 9806 A3
- 9807 B4
- 9808 B4
- 9809 B4
- 9810 A2
- 9811 C5
- 9813 B5
- 9814 D2
- 9815 C2
- 9816 D2
- 9817 B1
- 9818 B3
- 9819 B5
- 9820 C5
- 9821 C5
- 9822 D1
- 9823 D2
- 9824 D2
- 9826 B1
- 9828 C2
- 9829 B3

- |         |         |         |         |
|---------|---------|---------|---------|
| 2801 A3 | 3811 B4 | 3865 D5 | 7801 B1 |
| 2805 D4 | 3812 D5 | 3866 C5 | 7804 D5 |
| 2806 D4 | 3813 C2 | 3867 D4 | 7806 C1 |
| 2807 D4 | 3814 B4 | 3868 C5 | 7807 A2 |
| 2808 C4 | 3815 D2 | 3869 C5 | 7808 A3 |
| 2810 C5 | 3816 B4 | 3870 B4 |         |
| 2811 D3 | 3817 B4 | 3871 C3 |         |
| 2812 D3 | 3818 D3 | 3872 C3 |         |
| 2813 C3 | 3819 B4 | 4800 C1 |         |
| 2814 D3 | 3820 B4 | 4801 C1 |         |
| 2815 C4 | 3821 C2 | 4802 C1 |         |
| 2816 C4 | 3822 C3 | 4803 C1 |         |
| 2817 C2 | 3823 C5 | 4804 C5 |         |
| 2818 D3 | 3824 C2 | 4805 B3 |         |
| 2820 D3 | 3825 B2 | 4806 B5 |         |
| 2821 C3 | 3828 C5 | 4807 A3 |         |
| 2823 C3 | 3829 B3 | 4808 B1 |         |
| 2824 B3 | 3830 B3 | 4811 A3 |         |
| 2825 B3 | 3831 C3 | 4814 A5 |         |
| 2827 B3 | 3832 B3 | 4815 A5 |         |
| 2829 B3 | 3833 B5 | 4819 A4 |         |
| 2830 D5 | 3834 C3 | 4822 D4 |         |
| 2832 A2 | 3835 C3 | 4826 D4 |         |
| 2833 B3 | 3836 A2 | 4827 A3 |         |
| 2834 B2 | 3837 B3 | 4828 B5 |         |
| 2835 B2 | 3838 C3 | 4831 B5 |         |
| 2836 B3 | 3839 A1 | 4834 B5 |         |
| 2837 B3 | 3840 B3 | 4836 D3 |         |
| 2838 C4 | 3841 B3 | 4837 D2 |         |
| 2839 C3 | 3843 B3 | 4838 C3 |         |
| 2840 B3 | 3844 C1 | 4839 D3 |         |
| 2841 C5 | 3845 C1 | 4840 C3 |         |
| 2842 D4 | 3846 D1 | 4841 D3 |         |
| 2843 C5 | 3847 B4 | 4843 C2 |         |
| 2844 C1 | 3848 A3 | 4844 D2 |         |
| 2845 A2 | 3850 B2 | 4850 B1 |         |
| 2850 C4 | 3852 B3 | 4851 C2 |         |
| 3803 D4 | 3853 C3 | 4852 D2 |         |
| 3804 C5 | 3858 B4 | 4860 B2 |         |
| 3805 C4 | 3859 C5 | 4861 C2 |         |
| 3806 C4 | 3860 C5 | 4862 B5 |         |
| 3807 C4 | 3861 D4 | 4863 B2 |         |
| 3808 C4 | 3862 D4 | 4864 B4 |         |
| 3809 B4 | 3863 D4 | 4866 B2 |         |
| 3810 B4 | 3864 D4 | 7800 C3 |         |

CD BOARD / copper side view  
(Universal Loader Phon/C)



10-8



202	3103 304 71780	DRAWER
203	3103 304 71800	SLIDER
204	3103 304 71820	PULLEY GEARWHEEL
205	3103 304 71830	GEARWHEEL
206	3103 304 71910	DRIVING BELT
207	3103 308 54160	MOTOR ASSY
210	3103 301 06660	SPRING SUPPORT
220	3103 304 71790	SUPPORT CD
222	4822 529 10387	RUBBER DAMPER CD DRIVE, FRONT
223	4822 529 10387	RUBBER DAMPER CD DRIVE, FRONT
230	3103 308 11940	CLAMPER ASSY DA11
240	3103 309 05380	CD DRIVE, MCD2
240	3103 309 05390	CD DRIVE DA12T3
8001	3103 308 93611	FLEXFOIL CABLE, 16P, 88mm BD
8002	3103 308 94021	FLEXFOIL CABLE, 8P, 268mm AD

ELECTRICAL PARTSLIST Universal Loader / ICD03 PhonIC MP3 Version

MOTOR BOARD

MISCELLANEOUS

1810	2422 025 16371	FFC-CONNECTOR, 8P, SIDE ENTRY
1811	2422 129 16655	LEAF SWITCH, 1P

CAPACITORS

2814©	5322 126 11583	10nF	10%	63V
2820©	4822 126 14043	1µF	20%	16V
2830©	2238 586 59812	100nF	10%	50V

RESISTORS

3811©	4822 051 30103	10kΩ	5%	0,06W
3812©	4822 051 30103	10kΩ	5%	0,06W
3813©	4822 117 13632	100kΩ	1%	0,06W
3814©	4822 051 30393	39kΩ	5%	0,06W
3815©	4822 117 12864	82kΩ	5%	0,06W

3816©	4822 051 30103	10kΩ	5%	0,06W
3820	4822 052 10228	2,2Ω	5%	0,33W
3830©	4822 051 30221	220Ω	5%	0,06W
3831©	4822 051 30221	220Ω	5%	0,06W
3832©	4822 051 30221	220Ω	5%	0,06W

DIODES

6830©	9340 548 52115	BZX284-C5V1
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INTEGRATED CIRCUITS

7810	9322 196 36682	AMM7072A, MOTOR DRIVER
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MP3 CD03 BOARD

Only complete board available

3103 308 67611	MP3 CD03 BOARD TXT5V
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CD BOARD

MISCELLANEOUS

1800	4822 267 11028	FFC-CONNECTOR, 16P, SIDE ENTRY
1801	4822 265 10979	FFC-CONNECTOR, 15P, SIDE ENTRY
1803	2422 025 16836	FFC-CONNECTOR, 19P, SIDE ENTRY
1805	2422 025 16371	FFC-CONNECTOR, 8P, SIDE ENTRY

CAPACITORS

2801©	3198 017 34730	47nF	10%	16V
2802	4822 124 41584	100µF	20%	10V
2803	4822 124 12052	220µF	20%	6,3V
2804	4822 124 11912	220µF	20%	6,3V
2805©	2020 552 94427	100pF	5%	50V

2806©	2238 916 11552	1,5nF	5%	25V
2807©	2238 916 11552	1,5nF	5%	25V
2808©	2020 552 94427	100pF	5%	50V
2809	4822 124 12052	220µF	20%	6,3V
2810©	2238 586 59812	100nF	10%	50V

2813©	2238 586 59812	100nF	10%	50V
2814©	2238 916 15641	22nF	10%	25V
2815©	5322 126 11578	1nF	10%	63V
2817©	2238 586 59812	100nF	10%	50V
2818©	2238 586 59812	100nF	10%	50V

2820©	2238 586 59812	100nF	10%	50V
2821©	3198 024 44730	47nF	5%	50V
2823©	2238 586 59812	100nF	10%	50V
2825©	5322 126 11583	10nF	10%	63V
2828	4822 124 40248	10µF	20%	63V

2829©	3198 017 41050	1µF	20%	10V
2830©	4822 126 13883	220pF	5%	50V
2831	4822 124 40248	10µF	20%	63V
2833©	5322 126 11582	6,8nF	10%	63V
2834©	3198 017 44740	470nF	20%	10V

2835©	4822 126 13482	470nF	20%	16V
2836©	3198 017 44740	470nF	20%	10V
2837©	4822 126 13879	220nF	20%	16V
2838©	2238 586 59812	100nF	10%	50V
2839©	2238 586 59812	100nF	10%	50V

2840©	2238 586 59812	100nF	10%	50V
2841©	4822 126 13883	220pF	5%	50V
2842©	4822 126 13883	220pF	5%	50V
2843©	4822 126 13883	220pF	5%	50V
2844©	5322 126 11583	10nF	10%	63V

2845©	2238 586 59812	100nF	10%	50V
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RESISTORS

3803©	4822 051 30109	10Ω	5%	0,06W
3804©	4822 051 30109	10Ω	5%	0,06W
3805©	4822 051 30471	470Ω	5%	0,06W
3806©	4822 051 30471	470Ω	5%	0,06W
3807©	4822 051 30471	470Ω	5%	0,06W

3808©	4822 051 30471	470Ω	5%	0,06W
3809©	4822 051 30102	1kΩ	5%	0,06W
3810©	4822 051 30471	470Ω	5%	0,06W
3811©	4822 051 30471	470Ω	5%	0,06W
3812©	4822 051 30472	4,7kΩ	5%	0,06W

3813©	4822 051 30339	33Ω	5%	0,06W
3814©	4822 051 30471	470Ω	5%	0,06W
3815©	4822 117 13608	4,7Ω	5%	0,06W
3816©	4822 051 30471	470Ω	5%	0,06W
3817©	4822 051 30471	470Ω	5%	0,06W

3818©	4822 051 30223	22kΩ	5%	0,06W
3819©	4822 051 30471	470Ω	5%	0,06W
3820©	4822 051 30471	470Ω	5%	0,06W
3821©	4822 117 13608	4,7Ω	5%	0,06W
3822©	4822 117 12917	1Ω	5%	0,06W

ELECTRICAL PARTSLIST Universal Loader / ICD03 PhonIC MP3 Version

RESISTORS

3823©	4822 051 30102	1kΩ	5%	0,06W
3824©	5322 117 13028	12kΩ	1%	0,06W
3825©	5322 117 13033	15kΩ	1%	0,06W
3828©	4822 051 30152	1,5kΩ	5%	0,06W
3831©	4822 051 30103	10kΩ	5%	0,06W for DA12 drive only

3832©	4822 117 12971	15Ω	5%	0,06W
3833©	4822 051 30152	1,5kΩ	5%	0,06W
3834©	4822 051 30101	100Ω	5%	0,06W
3835©	4822 051 30103	10kΩ	5%	0,06W for MCD2 drive only
3836©	4822 117 13608	4,7Ω	5%	0,06W

3837©	4822 051 30152	1,5kΩ	5%	0,06W
3838©	4822 051 30102	1kΩ	5%	0,06W
3839©	4822 051 30221	220Ω	5%	0,06W
3840©	4822 051 30223	22kΩ	5%	0,06W
3841©	4822 051 30102	1kΩ	5%	0,06W

3843©	4822 051 30222	2,2kΩ	5%	0,06W
3844©	4822 051 30103	10kΩ	5%	0,06W
3845©	4822 051 30471	470Ω	5%	0,06W
3846©	4822 051 30479	47Ω	5%	0,06W
3847©	4822 051 30223	22kΩ	5%	0,06W

3848©	4822 117 13613	2,2Ω	5%	0,06W
3850©	4822 051 30183	18kΩ	5%	0,06W
3852©	4822 051 30472	4,7kΩ	5%	0,06W
3853©	4822 051 30472	4,7kΩ	5%	0,06W for MCD2 drive only
3853©	4822 051 30682	6,8kΩ	5%	0,06W for DA12 drive only

3858©	4822 051 30152	1,5kΩ	5%	0,06W
3859©	4822 051 30101	100Ω	5%	0,06W
3860©	4822 051 30101	100Ω	5%	0,06W
3861©	4822 051 30223	22kΩ	5%	0,06W
3862©	4822 051 30223	22kΩ	5%	0,06W

3863©	4822 051 30223	22kΩ	5%	0,06W
3864©	4822 051 30223	22kΩ	5%	0,06W
3865©	4822 051 30123	12kΩ	5%	0,06W
3866©	4822 051 30123	12kΩ	5%	0,06W
3867©	4822 051 30123	12kΩ	5%	0,06W

3868©	4822 051 30123	12kΩ	5%	0,06W
3869©	4822 051 30101	100Ω	5%	0,06W
3870©	4822 117 12925	47kΩ	1%	0,06W
3871©	4822 051 20008	CHIP JUMPER 0805		
4800©	4822 051 30008	CHIP JUMPER 0603 for MCD2 drive only		

4801©	4822 051 30008	CHIP JUMPER 0603 for DA12 drive only		
4802©	4822 051 30008	CHIP JUMPER 0603 for DA12 drive only		
4803©	4822 051 30008	CHIP JUMPER 0603 for MCD2 drive only		
4804©	4822 051 30008	CHIP JUMPER 0603		
4805©	4822 051 20008	CHIP JUMPER 0805		

4806©	4822 051 20008	CHIP JUMPER 0805		
4807©	4822 051 20008	CHIP JUMPER 0805		
4808©	4822 051 20008	CHIP JUMPER 0805		
4811©	4822 051 20008	CHIP JUMPER 0805		
4814©	4822 051 20008	CHIP JUMPER 0805		

4815©	4822 051 30008	CHIP JUMPER 0603		
4819©	4822 051 20008	CHIP JUMPER 0805		
4822©	4822 051 20008	CHIP JUMPER 0805		
4826©	4822 051 30008	CHIP JUMPER 0603		
4827©	4822 051 20008	CHIP JUMPER 0805		

4828©	4822 051 20008	CHIP JUMPER 0805		
4831©	4822 051 20008	CHIP JUMPER 0805		
4834©	4822 051 30008	CHIP JUMPER 0603		
4836©	4822 051 20008	CHIP JUMPER 0805		
4837©	4822 051 20008	CHIP JUMPER 0805		

4838©	4822 051 20008	CHIP JUMPER 0805		
4839©	4822 051 30008	CHIP JUMPER 0603		
4840©	4822 051 30008	CHIP JUMPER 0603		
4841©	4822 051 20008	CHIP JUMPER 0805		

RESISTORS

4843©	4822 051 20008	CHIP JUMPER 0805		
4844©	4822 051 20008	CHIP JUMPER 0805		
4850©	4822 051 30008	CHIP JUMPER 0603		
4851©	4822 051 30008	CHIP JUMPER 0603		
4852©	4822 051 20008	CHIP JUMPER 0805		

4860©	4822 051 30008	CHIP JUMPER 0603		
4861©	4822 051 30008	CHIP JUMPER 0603		
4862©	4822 051 20008	CHIP JUMPER 0805		
4863©	4822 051 20008	CHIP JUMPER 0805		
4864©	4822 051 20008	CHIP JUMPER 0805		

4866©	4822 051 30008	CHIP JUMPER 0603		
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COILS

1810	2422 540 98519	RESONATOR 8,467MHz
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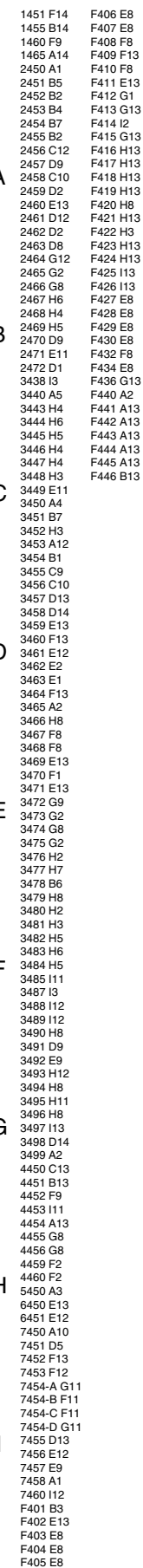
TRANSISTORS

7806©	5322 130 60159	BC846B
7807©	4822 130 60373	BC856B
7808©	4822 130 60373	BC856B

INTEGRATED CIRCUITS

7800©	9352 731 95557	SAA7825H, SIGNAL PROC. PHONIC
7801©	9322 181 79668	MM1469PH, MOTOR DRIVER
7802	4822 209 72554	MC7808CT, 8V Regulator
7804©	5322 209 82941	LM358D, DUAL OP-AMP.

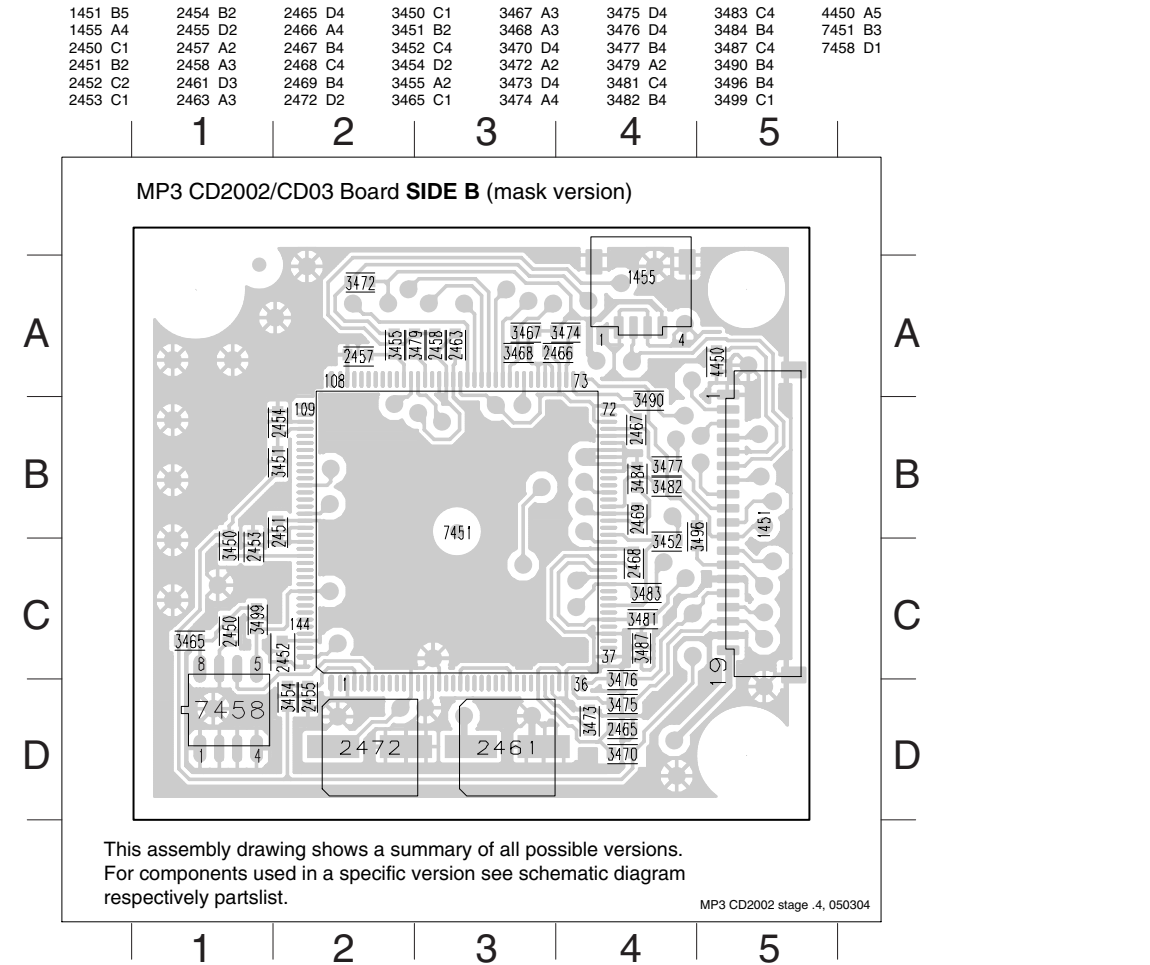
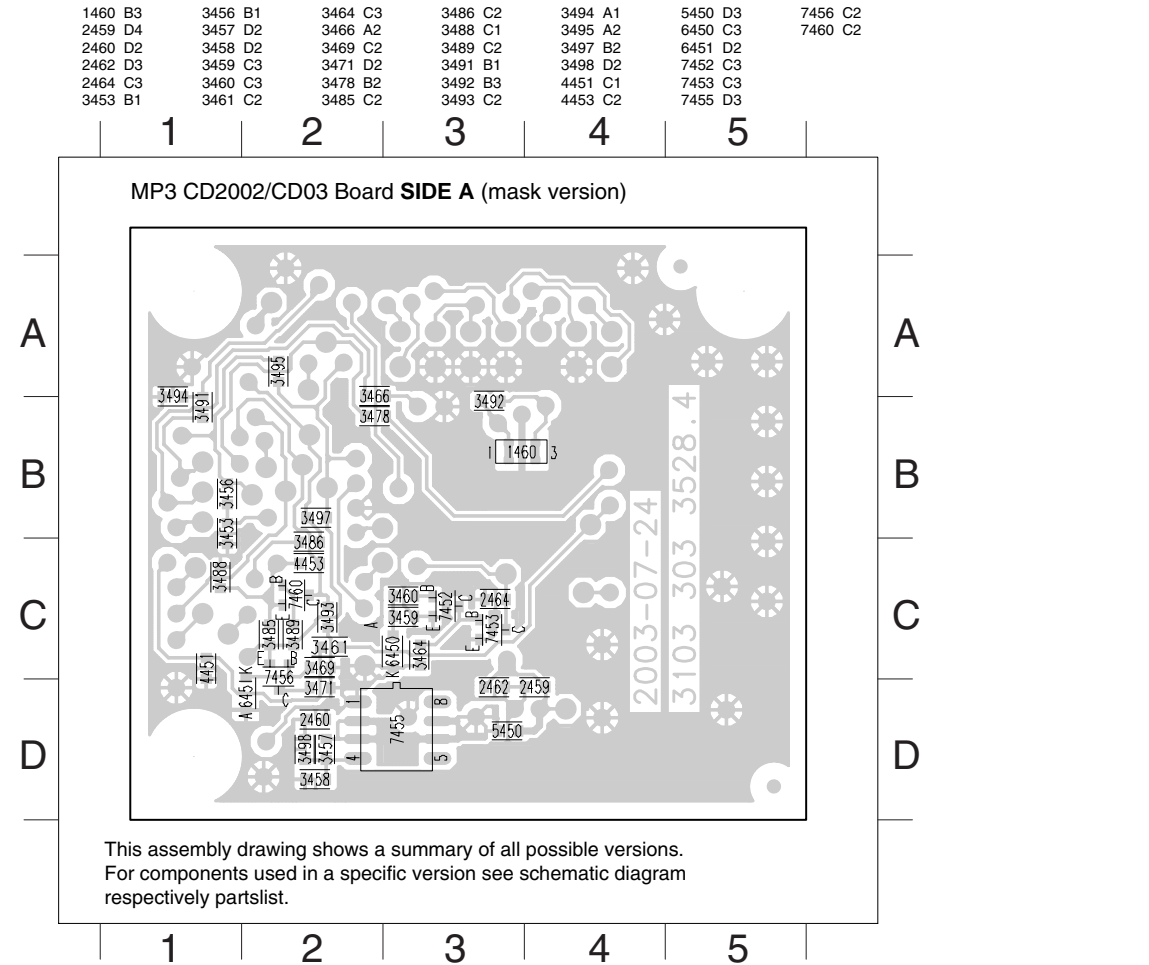
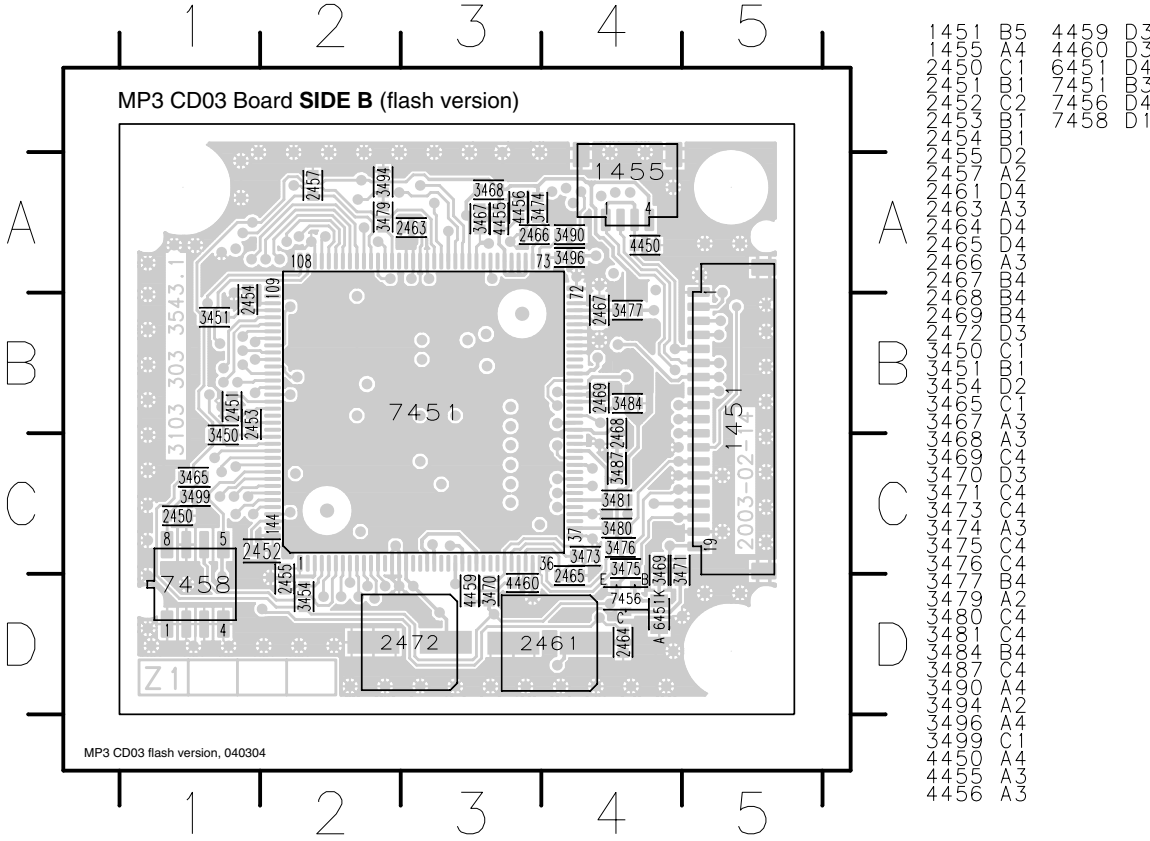
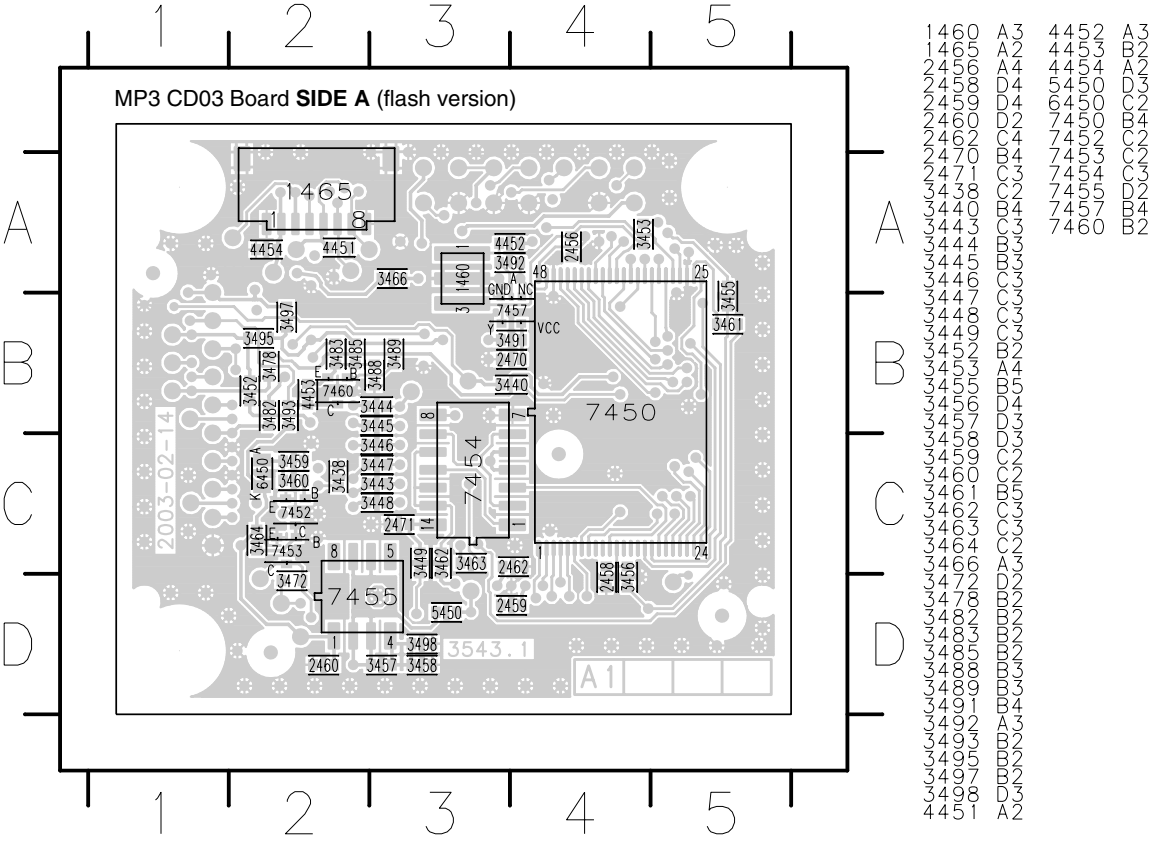
## MP3 CD 2003 Board (flash version)



```
# ... only for FLASH version
* ... only for ROM version
```



MP3 BOARD FOR ORIENTATION ONLY



PERSONAL NOTES:

*Brief introduction of the Regulator Board*

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- The regulator board provides the following:
- a) 12V supply: +12V\_A and +12V\_M derived from the +A supply
  - b) 5,6V and 5V supply: +5V6 and 5V\_VCD derived from the +A/2 supply

*Technical Remarks*

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# COMBI & REGULATOR BOARDS

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**Regulator Board**

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**Combi Board**

Component View seen from Copper Side ..... 11-4

Copper Side View ..... 11-5

Circuit diagram - Source Selector part ..... 11-6

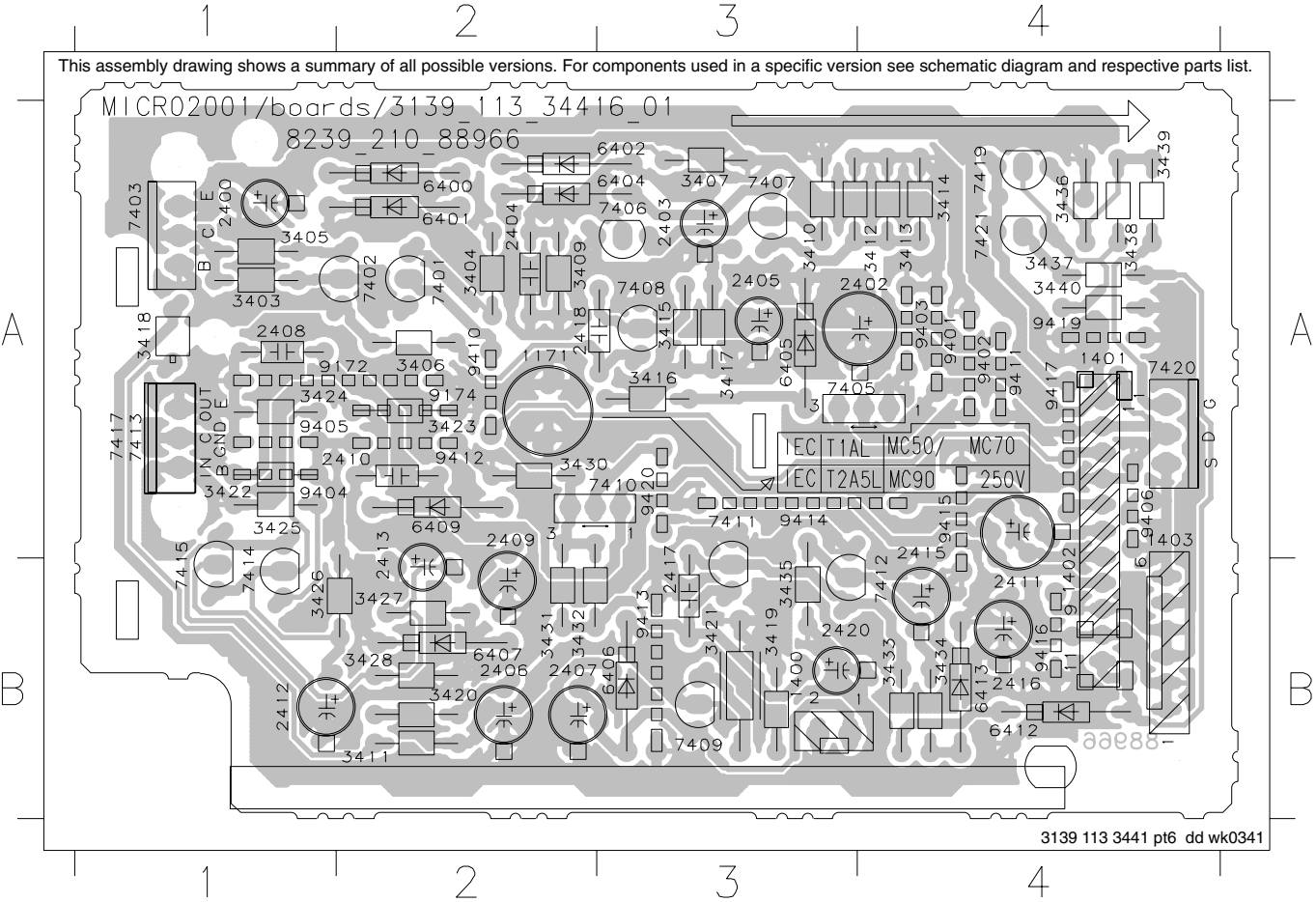
Circuit diagram - Amplifier part ..... 11-7

Electrical parts list ..... 11-8

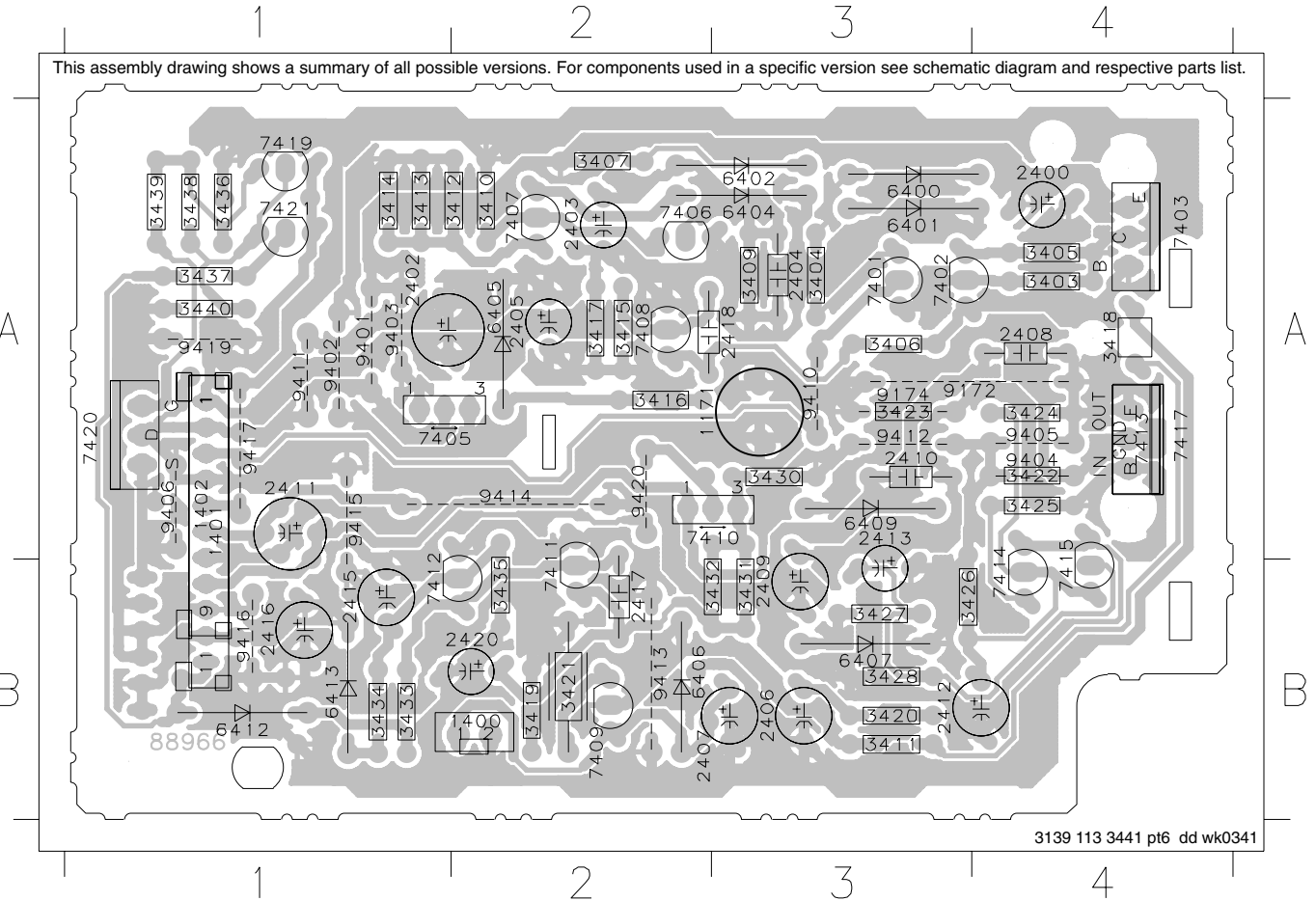
REGULATOR BOARD - COMPONENT SIDE VIEW

1171 A2	2408 A1	3404 A2	3417 A3	3430 A2	6401 A2	7405 A3	7419 A4	9411 A4
1400 B3	2409 A2	3405 A1	3418 A1	3431 B2	6402 A3	7406 A3	7420 A4	9412 A2
1401 A4	2410 A2	3406 A2	3419 B3	3432 B2	6404 A3	7407 A3	7421 A4	9413 B3
1402 B4	2411 B4	3407 A3	3420 B2	3433 B4	6405 A3	7408 A3	9172 A2	9414 A3
1403 A4	2412 B1	3409 A2	3421 B3	3434 B4	6406 B3	7409 B3	9174 A2	9415 A4
2400 A1	2413 A2	3410 A3	3422 A1	3435 B3	6407 B2	7410 A3	9401 A4	9416 B4
2402 A4	2415 A4	3411 B2	3423 A2	3436 A4	6409 A2	7411 A3	9402 A4	9417 A4
2403 A3	2416 B4	3412 A4	3424 A1	3437 A4	6412 B4	7412 B4	9403 A4	9419 A4
2404 A2	2417 B3	3413 A4	3425 A1	3438 A4	6413 B4	7413 A1	9404 A1	9420 A3
2405 A3	2418 A2	3414 A4	3426 B1	3439 A4	7401 A2	7414 B1	9405 A1	
2406 B2	2420 B3	3415 A3	3427 B2	3440 A4	7402 A2	7415 B1	9406 A4	
2407 B2	3403 A1	3416 A3	3428 B2	6400 A2	7403 A1	7417 A1	9410 A2	



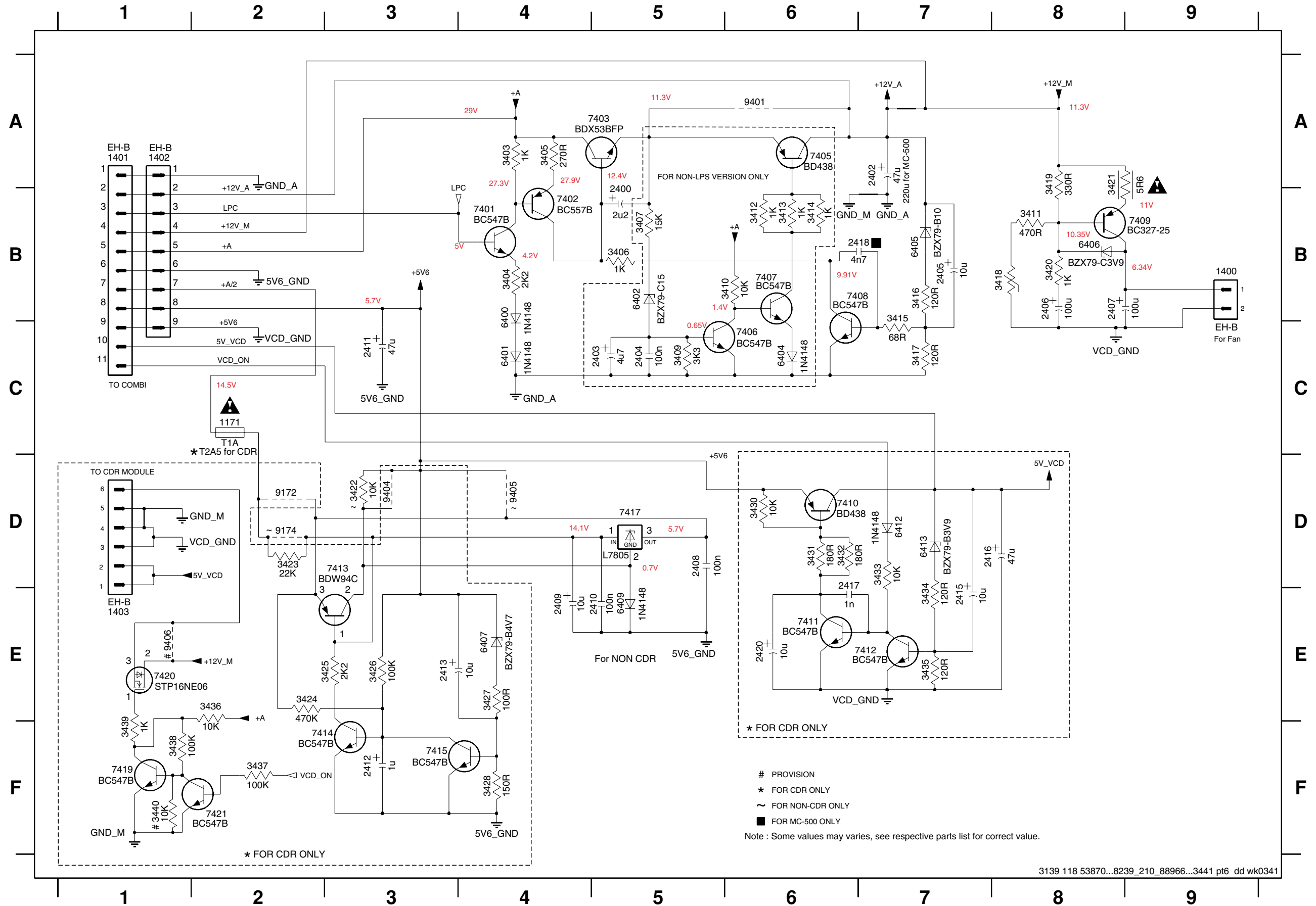
REGULATOR BOARD - COPPER SIDE VIEW

1171 A2	2409 B3	3405 A4	3418 A4	3431 B3	6402 A3	7406 A2	7420 A1	9412 A3
1400 B2	2410 A3	3406 A3	3419 B2	3432 B3	6404 A3	7407 A2	7421 A1	9413 B2
1401 A1	2411 A1	3407 A2	3420 B3	3433 B1	6405 A2	7408 A2	9172 A3	9414 A2
1402 A1	2412 B3	3409 A3	3421 B2	3434 B1	6406 B2	7409 B2	9174 A3	9415 A1
2400 A4	2413 A3	3410 A2	3422 A4	3435 B2	6407 B3	7410 A3	9401 A1	9416 B1
2402 A1	2415 B1	3411 B3	3423 A3	3436 A1	6409 A3	7411 B2	9402 A1	9417 A1
2403 A2	2416 B1	3412 A2	3424 A4	3437 A1	6412 B1	7412 B1	9403 A1	9419 A1
2404 A3	2417 B2	3413 A1	3425 A4	3438 A1	6413 B1	7413 A4	9404 A4	9420 A2
2405 A2	2418 A3	3414 A1	3426 B3	3439 A1	7401 A3	7414 B4	9405 A4	
2406 B3	2420 B2	3415 A2	3427 B3	3440 A1	7402 A3	7415 B4	9406 A1	
2407 B2	3403 A4	3416 A2	3428 B3	6400 A3	7403 A4	7417 A4	9410 A3	
2408 A4	3404 A3	3417 A2	3430 A3	6401 A3	7405 A1	7419 A1	9411 A1	

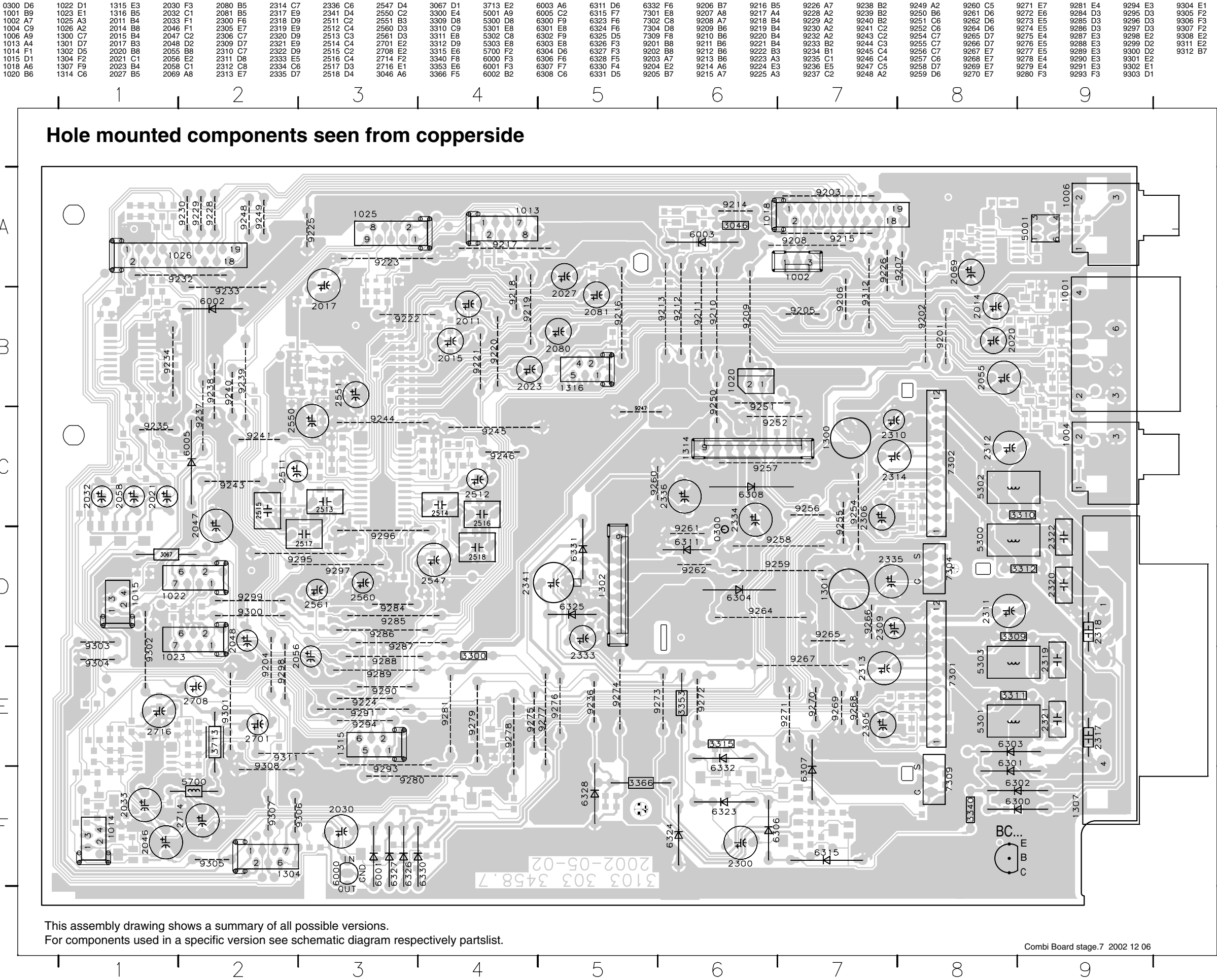


## REGULATOR BOARD - CIRCUIT DIAGRAM

1171 C2	1403 E1	2404 C5	2408 D5	2412 F3	2417 D6	3404 B4	3409 C5	3413 B6	3417 C7	3421 A8	3425 E3	3430 D6	3434 E7	3438 F1	6401 C4	6406 B8	6413 D7	7405 A6	7409 B9	7413 D3	7419 F1	9174 D2	9406 E1
1400 B9	2400 B5	2405 B7	2409 E4	2413 E3	2418 B7	3405 A4	3410 B6	3414 B6	3418 B8	3422 D3	3426 E3	3431 D6	3435 E7	3439 F1	6402 B5	6407 E4	7401 B4	7406 C6	7410 D7	7414 F3	7420 E1	9401 A6	
1401 A1	2402 A7	2406 B8	2410 E5	2415 E7	2420 E6	3406 B5	3411 B8	3415 C7	3419 A8	3423 D2	3427 E4	3432 D6	3436 E2	3440 F1	6404 C6	6409 E5	7402 B4	7407 B6	7411 E6	7415 F3	7421 F2	9404 D3	
1402 A1	2403 C5	2407 B8	2411 C3	2416 D7	3403 A4	3407 B5	3412 B6	3416 B7	3420 B8	3424 E2	3428 F4	3433 D7	3437 F2	6400 B4	6405 B7	6412 D7	7403 A4	7408 B7	7412 E7	7417 D5	9172 D2	9405 D4	

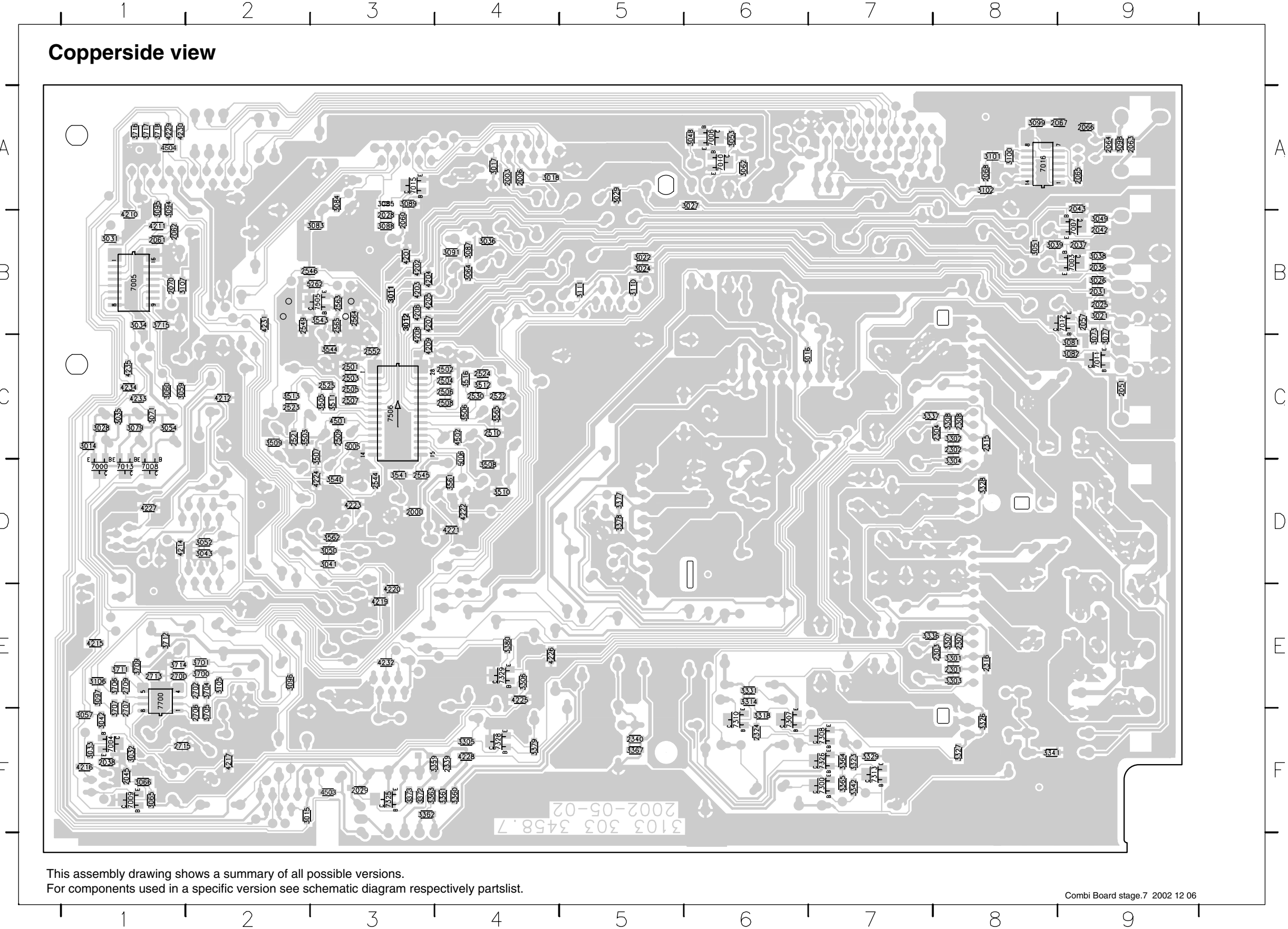


COMBI BOARD



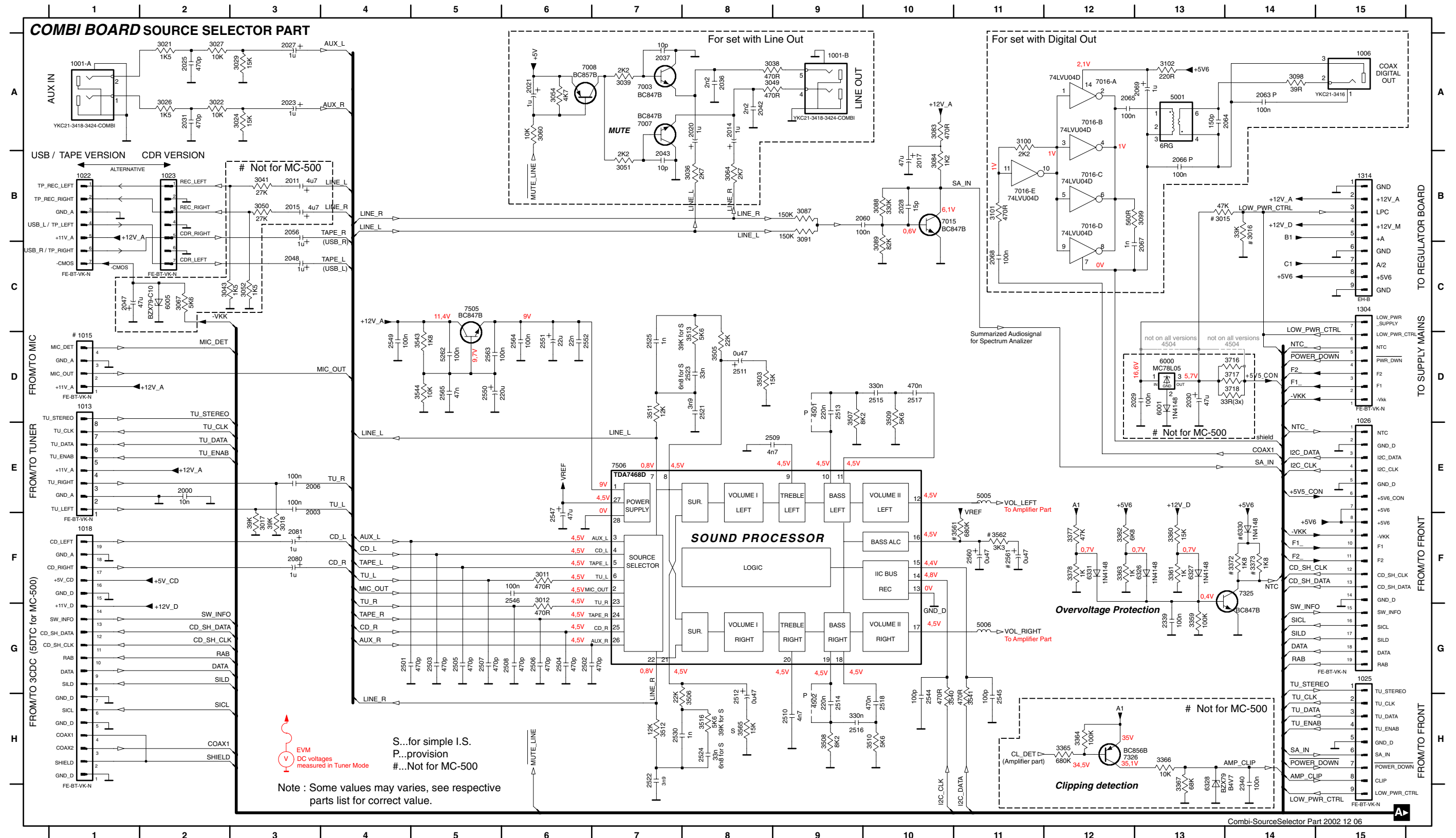
COMBI BOARD

2000 D3	2042 B9	2065 A9	2308 C8	2505 C3	2525 C3	2700 E1	3015 F2	3029 A5	3042 F1	3059 C1	3081 C9	3095 A1	3107 B1	3308 C8	3337 C7	3367 F5	3507 C3	3543 B3	3707 F1	4202 B3	4212 C2	4224 D3	4234 C1	7003 B9	7013 D1	7328 F4
2003 A4	2043 A9	2066 A9	2315 C8	2506 C4	2530 C4	2702 E2	3016 C6	3031 B1	3043 D2	3060 C1	3082 C9	3096 E2	3110 B5	3314 E6	3341 F8	3372 F3	3508 D4	3544 C3	3709 E1	4203 B3	4214 D1	4225 E4	4235 C1	7004 F1	7015 A3	7329 E4
2006 A4	2045 F1	2067 A9	2316 E8	2507 C3	2544 D3	2706 F2	3017 A4	3032 F1	3048 A6	3062 A6	3083 B3	3097 E1	3111 B5	3318 F6	3342 F7	3373 F3	3509 C2	3561 D4	3711 E1	4204 B3	4215 E1	4226 E4	4501 C3	7005 B1	7016 A8	7329 E4
2025 B9	2051 C9	2068 A8	2324 F6	2508 C4	2545 D3	2707 F1	3018 A4	3033 F1	3049 B9	3064 B4	3084 A3	3098 A9	3301 E8	3323 F7	3359 F3	3377 D5	3510 D4	3562 D3	3712 E1	4205 B3	4216 F1	4227 D1	4502 C4	7006 A6	7300 F7	7505 B3
2028 B3	2057 B9	2070 B1	2339 F4	2509 C3	2546 B2	2709 E1	3021 B9	3034 B1	3050 D3	3065 F1	3085 A3	3099 A8	3302 C8	3326 F8	3360 F4	3378 D5	3511 C3	3565 C4	3714 E1	4206 B3	4217 F2	4228 F4	4503 F3	7007 B9	7307 F6	7506 C3
2029 F3	2060 B3	2301 E8	2340 F5	2510 C4	2549 B2	2713 E1	3022 B5	3035 C1	3051 B8	3066 F1	3087 B4	3100 A8	3303 E8	3327 F8	3361 F3	3379 F4	3512 C4	3700 E2	3715 B1	4207 B3	4219 E3	4229 A1	4504 A1	7008 D1	7308 F7	7700 E1
2031 B9	2061 B1	2302 C8	2501 C3	2521 C2	2552 C3	2715 F1	3024 B5	3036 B4	3052 D2	3071 C1	3088 B3	3101 A8	3304 D8	3328 D8	3362 F3	3380 E4	3513 C2	3701 E2	3716 A1	4208 C3	4220 E3	4230 A1	5005 C3	7009 F1	7310 F6	
2036 B9	2062 B1	2303 E8	2502 C4	2522 C4	2563 B3	3011 B3	3026 B9	3038 B9	3053 A6	3073 C9	3089 A3	3102 A8	3305 F4	3329 F7	3363 F3	3503 C3	3516 C4	3704 E2	3717 A1	4209 C3	4221 D4	4231 B2	5006 D4	7010 A6	7313 F3	
2037 B9	2063 A9	2304 C8	2503 C3	2523 C2	2564 B3	3012 B3	3027 A6	3039 B8	3054 C1	3077 C9	3091 B4	3105 E2	3306 E4	3331 E6	3364 F7	3505 C3	3540 D3	3705 F2	3718 A1	4210 B1	4222 D4	4232 E3	5262 B3	7011 C9	7325 F3	
2038 F1	2064 A9	2307 E8	2504 C4	2524 C4	2565 B3	3014 C1	3028 C1	3041 D3	3057 F1	3079 C1	3094 A1	3106 E1	3307 E8	3336 E7	3365 F7	3506 C4	3541 D3	3706 E1	4201 B3	4211 B1	4223 D3	4233 C1	7000 D1	7012 B9	7326 F7	

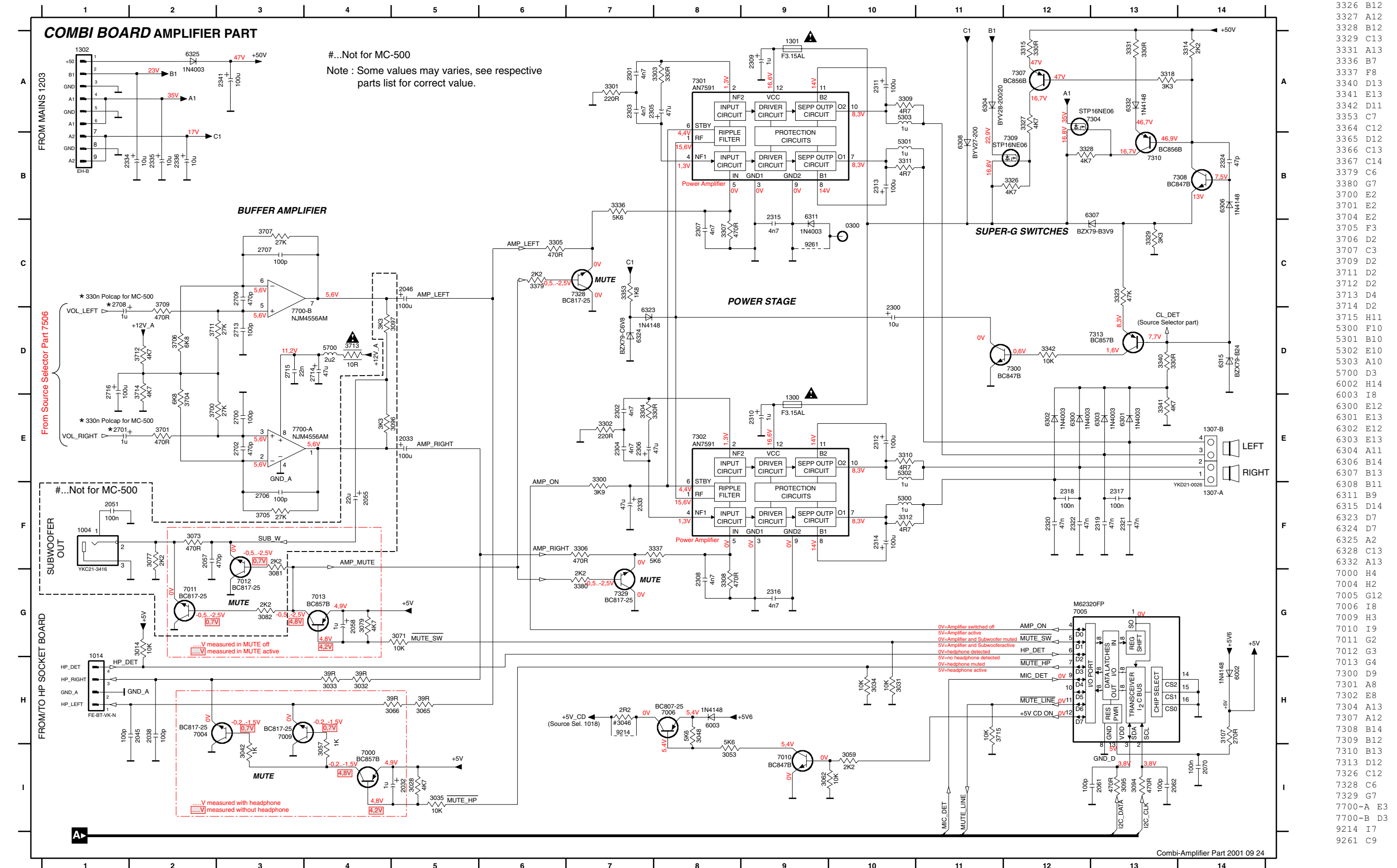




1001-A	A1	1025	G15	2015	B3	2031	A2	2064	A13	2502	G6	2512	H8	2524	H8	2552	D6	3021	A2	3043	A2	3084	B9	3102	A13	3503	D8	3516	H8	3718	E14	6326	G13	7016-D	B12
1001-B	A9	1026	E15	2017	B9	2036	A8	2065	A12	2503	G5	2513	D9	2525	D7	2560	D11	3022	A3	3049	A8	3085	B10	3110	A3	3505	D8	3540	H10	4501	D9	6327	G13	7016-E	B11
1002	A15	1304	C15	2020	A8	2037	A7	2066	B13	2504	G6	2514	H9	2530	H7	2561	D11	3024	A3	3050	B3	3087	B9	3111	A3	3506	H8	3541	H11	4502	H9	6331	G12	7016-F	A11
1006	A15	1314	B15	2021	A6	2042	A8	2067	C13	2505	G5	2515	D10	2544	H10	2563	D5	3026	A2	3051	B7	3088	B10	3359	G13	3507	D9	3543	D5	4503	D13	7003	A7	7325	G14
1013	D1	1316	A4	2023	A3	2043	B7	2068	C11	2506	G6	2516	H9	2545	H11	2564	D6	3027	A3	3052	B3	3089	C10	3360	F13	3508	H9	3544	D5	4504	D14	7007	A7	7505	C5
1015	D1	2000	E2	2025	A2	2047	C1	2069	A13	2507	G5	2517	D10	2546	F6	2565	D5	3029	A3	3054	A6	3091	C9	3361	G13	3509	D10	3561	D10	5001	A13	7008	A6	7506	E7
1018	F1	2003	E3	2027	A3	2048	C3	2080	F3	2508	G6	2518	H10	2547	E6	3015	D14	3036	B8	3060	A6	3098	A14	3362	F13	3510	H10	3562	D11	5262	D5	7015	B10		
1020	H13	2006	E3	2028	B10	2056	B3	2081	F3	2509	H8	2521	D8	2549	D4	3016	D14	3038	A8	3064	B8	3099	B13	3363	G12	3511	D7	3565	H8	6000	D13	7016-A	A12		
1022	B1	2011	B3	2029	D13	2060	B9	2339	G13	2510	H9	2522	H7	2550	D5	3017	E3	3039	A7	3067	C2	3100	A11	3377	G12	3512	H7	3716	D14	6001	D13	7016-B	A12		
1023	B2	2014	A8	2030	D13	2063	A14	2501	G4	2511	D8	2523	D8	2551	D6	3018	E3	3041	B3	3083	B9	3101	B11	3378	G12	3513	D8	3717	E14	6005	C2	7016-C	B12		



0300	C10	1307-A	F14	2045	H2	2061	I13	2303	A7	2309	A9	2315	B9	2321	F13	2336	B2	2706	F3	2715	D4	3033	H4	3053	I8	3071	G4	3094	I13	3107	H14	3305	C6	3311	B10
1004	F1	1307-B	E14	2046	C5	2062	I13	2304	E7	2310	E9	2316	G9	2322	F12	2340	C14	2707	C3	2716	D1	3034	H10	3057	H4	3073	F2	3095	I13	3300	F7	3306	F7	3312	F10
1014	G1	1315	B1	2051	F1	2070	I14	2305	A7	2311	A10	2317	F13	2324	B14	2341	A3	2708	D1	3014	G2	3035	I5	3059	I10	3077	F2	3096	E4	3301	A7	3307	C8	3314	A14
1300	E9	2032	I5	2055	F4	2300	D9	2306	E7	2312	E10	2318	F12	2333	F7	2700	E3	2709	C3	3028	I5	3042	H3	3062	I9	3079	G4	3097	D4	3302	E7	3308	G8	3315	A12
1301	A9	2033	E5	2057	F2	2301	A7	2307	C8	2313	B10	2319	F13	2334	B1	2701	E1	2713	D3	3031	H10	3046	I7	3065	H5	3081	G3	3105	C2	3303	A8	3309	A10	3318	A13
1302	A1	2038	H2	2058	G4	2302	E7	2308	G8	2314	F10	2320	F12	2335	B2	2702	E3	2714	E3	3032	H4	3048	I8	3066	H5	3082	G3	3106	C2	3304	E7	3310	E10	3323	C13



**MECHANICAL PARTS LIST**

0202 4822 492 11735 SPRING TRANS

**ELECTRICAL PARTS LIST - REGULATOR BOARD****MISCELLANEOUS**

1171 4822 071 51002 Δ Fuse RAD LT 1A 250V

**CAPACITORS**

2402 2022 020 00625 220uF 20% 16V  
 2405 4822 124 11947 10uF 20% 16V  
 2406 4822 124 41643 100uF 20% 16V  
 2407 4822 124 41643 100uF 20% 16V  
 2408 2020 561 90365 100nF +80/-20% 50V  
 2409 4822 124 40248 10uF 20% 63V  
 2410 2020 561 90365 100nF +80/-20% 50V  
 2411 4822 124 12233 47uF 20% 25V  
 2418 4822 126 11714 4,7nF 20%

**RESISTORS**

3403 4822 050 11002 1k 1% 0,4W  
 3404 4822 116 52256 2k2 5% 0,5W  
 3405 4822 116 83876 270R 5% 0,5W  
 3406 4822 050 11002 1k 1% 0,4W  
 3411 4822 116 83883 470R 5% 0,5W  
 3415 4822 116 52199 68R 5% 0,5W  
 3416 4822 116 52206 120R 5% 0,5W  
 3417 4822 116 52206 120R 5% 0,5W  
 3418 4822 117 12063 NTC DC 5W 10k 5%  
 3419 4822 116 52219 330R 5% 0,5W  
 3420 4822 050 11002 1k 1% 0,4W  
 3421 4822 052 10568 Δ 5R6 5% 0,33W  
 3422 4822 050 21003 10k 1% 0,6W

**DIODES**

6400 4822 130 30621 1N4148  
 6401 4822 130 30621 1N4148  
 6405 4822 130 61219 BZX79-B10  
 6406 4822 130 34174 BZX79-C4V7  
 6409 4822 130 30621 1N4148

**TRANSISTORS & INTEGRATED CIRCUITS**

7401 4822 130 40959 BC547B  
 7402 4822 130 44568 BC557B  
 7403 9322 139 23687 TRA POW BDX53BFP  
 7408 4822 130 40959 BC547B  
 7409 4822 130 41246 BC327-25  
 7417 4822 209 31841 IC L7805CP

Note : Only the parts mentioned in this list are normal  
 service spare parts.

**ELECTRICAL PARTS LIST - COMBI BOARD****MISCELLANEOUS**

1001 4822 265 20553 Socket Cinch 2P - Aux in  
 1013 4822 265 11515 Flex Connector 8P  
 1014 4822 267 10733 Flex Connector 4P  
 1018 4822 265 10981 Flex Connector 15P  
 1022 4822 267 10953 Flex Connector 7P  
 1025 2422 025 14518 Flex Connector 9P  
 1026 4822 265 11553 Flex Connector 19P  
 1300 4822 252 11225 Δ Fuse RAD LF 3,15A 250V  
 1301 4822 252 11225 Δ Fuse RAD LF 3,15A 250V  
 1304 4822 267 10953 Flex Connector 7P  
 1307 4822 267 31176 Speaker Terminal 4P

**CAPACITORS**

2000 5322 126 11583 10nF 10% 50V  
 2003 2238 586 59812 100nF +80/-20% 50V  
 2006 2238 586 59812 100nF +80/-20% 50V  
 2011 2022 020 00734 1uF 20% 50V  
 2015 2022 020 00734 1uF 20% 50V  
 2023 2022 020 00734 1uF 20% 50V  
 2025 4822 126 13881 470pF 5% 50V  
 2027 2022 020 00734 1uF 20% 50V  
 2031 4822 126 13881 470pF 5% 50V  
 2032 4822 124 22651 1uF 20% 50V  
 2033 4822 124 23052 100uF 20% 16V  
 2038 2020 552 94427 100pF 5% 50V  
 2045 2020 552 94427 100pF 5% 50V  
 2046 4822 124 23052 100uF 20% 16V  
 2047 4822 124 81286 47uF 20% 16V  
 2048 2022 020 00734 1uF 20% 50V  
 2056 2022 020 00734 1uF 20% 50V  
 2058 4822 124 22651 1uF 20% 50V  
 2061 2020 552 94427 100pF 5% 50V  
 2062 2020 552 94427 100pF 5% 50V  
 2070 2238 586 59812 100nF +80/-20% 50V  
 2080 2022 020 00734 1uF 20% 50V  
 2081 2022 020 00734 1uF 20% 50V  
 2300 4822 124 12255 10uF 20% 50V  
 2301 4822 126 13193 4,7nF 10% 63V  
 2302 4822 126 13193 4,7nF 10% 63V  
 2303 4822 126 13193 4,7nF 10% 63V  
 2304 4822 126 13193 4,7nF 10% 63V  
 2305 3198 028 44790 47uF 20% 35V  
 2306 3198 028 44790 47uF 20% 35V  
 2307 4822 126 13193 4,7nF 10% 63V  
 2308 4822 126 13193 4,7nF 10% 63V  
 2309 4822 124 22651 1uF 20% 50V  
 2310 4822 124 22651 1uF 20% 50V  
 2311 4822 124 40207 100uF 20% 25V  
 2312 4822 124 40207 100uF 20% 25V  
 2313 4822 124 40207 100uF 20% 25V  
 2314 4822 124 40207 100uF 20% 25V  
 2315 4822 126 13193 4,7nF 10% 63V

2316 4822 126 13193 4,7nF 10% 63V  
 2317 2020 561 90365 100nF +80/-20% 50V  
 2318 2020 561 90365 100nF +80/-20% 50V  
 2319 4822 121 43526 47nF 5% 250V  
 2320 4822 121 43526 47nF 5% 250V  
 2321 4822 121 43526 47nF 5% 250V  
 2322 4822 121 43526 47nF 5% 250V  
 2324 4822 126 11785 47pF 5% 50V  
 2333 4822 124 40433 47uF 20% 25V  
 2334 4822 124 12255 10uF 20% 50V  
 2335 4822 124 12255 10uF 20% 50V  
 2336 4822 124 12255 10uF 20% 50V  
 2339 2238 586 59812 100nF +80/-20% 50V  
 2341 4822 124 40255 100uF 20% 63V  
 2341 2020 012 93664 100uF 20% 50V  
 2501 4822 126 13881 470pF 5% 50V  
 2502 4822 126 13881 470pF 5% 50V  
 2503 4822 126 13881 470pF 5% 50V  
 2504 4822 126 13881 470pF 5% 50V  
 2505 4822 126 13881 470pF 5% 50V  
 2506 4822 126 13881 470pF 5% 50V  
 2507 4822 126 13881 470pF 5% 50V  
 2508 4822 126 13881 470pF 5% 50V  
 2509 4822 126 13193 4,7nF 10% 63V  
 2510 4822 126 13193 4,7nF 10% 63V  
 2511 5322 124 41948 470nF 20% 50V  
 2512 5322 124 41948 470nF 20% 50V  
 2513 4822 121 42408 220nF 5% 63V  
 2514 4822 121 42408 220nF 5% 63V  
 2515 4822 121 51252 470nF 5% 63V  
 2516 4822 121 51252 470nF 5% 63V  
 2517 4822 121 51252 470nF 5% 63V  
 2518 4822 121 51252 470nF 5% 63V  
 2521 5322 126 11579 3,3nF 10% 63V  
 2522 5322 126 11579 3,3nF 10% 63V  
 2523 4822 126 14549 33nF 16V  
 2524 4822 126 14549 33nF 16V  
 2525 3198 016 31020 1nF 25V  
 2530 3198 016 31020 1nF 25V  
 2544 2020 552 94427 100pF 5% 50V  
 2545 2020 552 94427 100pF 5% 50V  
 2546 4822 126 14585 100nF 10% 50V  
 2547 4822 124 81286 47uF 20% 16V  
 2549 2238 586 59812 100nF +80/-20% 50V  
 2550 4822 124 40433 47uF 20% 25V  
 2551 4822 124 81151 22uF 50V  
 2552 2238 916 15641 22nF 10% 25V  
 2560 5322 124 41948 470nF 20% 50V  
 2563 2238 586 59812 100nF +80/-20% 50V  
 2700 2020 552 94427 100pF 5% 50V  
 2701 5322 121 42661 330nF 5% 63V  
 2702 4822 126 13881 470pF 5% 50V

**ELECTRICAL PARTS LIST - COMBI BOARD****CAPACITORS**

2706	2020 552 94427	100pF 5% 50V
2707	2020 552 94427	100pF 5% 50V
2708	5322 121 42661	330nF 5% 63V
2709	4822 126 13881	470pF 5% 50V
2713	2020 552 94427	100pF 5% 50V
2714	4822 124 81286	47uF 20% 16V
2715	3198 017 42230	22nF 50V
2716	4822 124 23052	100uF 20% 16V

**RESISTORS**

3011	4822 051 20471	470R 5% 0,1W
3012	4822 051 20471	470R 5% 0,1W
3014	4822 051 30103	10k 5% 0,062W
3015	4822 117 12925	47k 1% 0,063W
3016	4822 051 30333	33k 5% 0,062W
3017	4822 051 30393	39k 5% 0,062W
3018	4822 051 30393	39k 5% 0,062W
3021	4822 051 30152	1k5 5% 0,062W
3022	4822 051 30103	10k 5% 0,062W
3024	4822 051 30153	15k 5% 0,062W
3026	4822 051 30152	1k5 5% 0,062W
3027	4822 051 30103	10k 5% 0,062W
3028	4822 051 30472	4k7 5% 0,062W
3029	4822 051 30153	15k 5% 0,062W
3031	4822 051 30103	10k 5% 0,062W
3032	2120 108 91909	RST SM 0603 ERJ3G 39R 5%
3033	2120 108 91909	RST SM 0603 ERJ3G 39R 5%
3034	4822 051 30103	10k 5% 0,062W
3035	4822 051 30103	10k 5% 0,062W
3041	4822 051 30273	27k 5% 0,062W
3042	4822 051 30102	1k 5% 0,062W
3043	4822 051 30152	1k5 5% 0,062W
3046	4822 116 80176	1R 5% 0,5W
3048	4822 051 30562	5k6 5% 0,063W
3050	4822 051 30273	27k 5% 0,062W
3052	4822 051 30152	1k5 5% 0,062W
3053	4822 051 30102	1k 5% 0,062W
3057	4822 051 30102	1k 5% 0,062W
3059	4822 051 30222	2k2 5% 0,062W
3062	4822 051 30103	10k 5% 0,062W
3065	2120 108 91909	RST SM 0603 ERJ3G 39R 5%
3066	2120 108 91909	RST SM 0603 ERJ3G 39R 5%
3067	4822 116 52289	5k6 5% 0,5W
3071	4822 051 30103	10k 5% 0,062W
3079	4822 051 30472	4k7 5% 0,062W
3094	4822 051 30471	470R 5% 0,062W
3095	4822 051 30471	470R 5% 0,062W
3107	4822 051 30271	270R 5% 0,062W
3300	4822 116 52276	3k9 5% 0,5W
3301	4822 051 30221	220R 5% 0,062W
3302	4822 051 30221	220R 5% 0,062W
3303	4822 051 30331	330R 5% 0,062W

3304	4822 051 30331	330R 5% 0,062W
3305	4822 051 30471	470R 5% 0,062W
3306	4822 051 30471	470R 5% 0,062W
3307	4822 051 30471	470R 5% 0,062W
3308	4822 051 30471	470R 5% 0,062W
3309	4822 050 24708	4R7 1% 0,6W
3310	4822 050 24708	4R7 1% 0,6W
3311	4822 050 24708	4R7 1% 0,6W
3312	4822 050 24708	4R7 1% 0,6W
3314	4822 051 30222	2k2 5% 0,062W
3315	4822 116 52219	330R 5% 0,5W
3318	4822 051 30332	3k3 5% 0,062W
3323	4822 117 12925	47k 1% 0,063W
3326	4822 051 30472	4k7 5% 0,062W
3327	4822 051 30472	4k7 5% 0,062W
3328	4822 051 30472	4k7 5% 0,062W
3329	4822 051 30332	3k3 5% 0,062W
3331	4822 051 30331	330R 5% 0,062W
3336	4822 051 30562	5k6 5% 0,063W
3337	4822 051 30562	5k6 5% 0,063W
3340	4822 116 52219	330R 5% 0,5W
3341	4822 051 30472	4k7 5% 0,062W
3342	4822 051 30103	10k 5% 0,062W
3353	4822 116 52249	1k8 5% 0,5W
3359	4822 117 13632	100k 1% 0,62W
3360	4822 051 30153	15k 5% 0,062W
3361	4822 051 30102	1k 5% 0,062W
3362	4822 051 30682	6k8 5% 0,062W
3363	4822 051 30102	1k 5% 0,062W
3372	4822 117 12903	1k8 1% 0,063W
3373	4822 117 12903	1k8 1% 0,063W
3377	4822 117 12925	47k 1% 0,063W
3378	4822 051 30102	1k 5% 0,062W
3379	4822 051 30222	2k2 5% 0,062W
3380	4822 051 30222	2k2 5% 0,062W
3503	4822 051 30153	15k 5% 0,062W
3505	4822 051 30102	1k 5% 0,062W
3506	4822 051 30102	1k 5% 0,062W
3507	5322 117 13056	8k2 1% 0,063W
3508	5322 117 13056	8k2 1% 0,063W
3509	4822 051 30562	5k6 5% 0,063W
3510	4822 051 30562	5k6 5% 0,063W
3511	4822 051 30123	12k 5% 0,062W
3512	4822 051 30123	12k 5% 0,062W
3513	4822 051 30562	5k6 5% 0,063W
3516	4822 051 30562	5k6 5% 0,063W
3540	4822 051 30471	470R 5% 0,062W
3541	4822 051 30471	470R 5% 0,062W
3543	4822 117 12903	1k8 1% 0,063W
3544	4822 051 30103	10k 5% 0,062W
3565	4822 051 30153	15k 5% 0,062W
3700	4822 051 30273	27k 5% 0,062W

**ELECTRICAL PARTS LIST - COMBI BOARD**

3701	4822 051 30471	470R 5% 0,062W
3704	4822 051 30682	6k8 5% 0,062W
3705	4822 051 30273	27k 5% 0,062W
3706	4822 051 30682	6k8 5% 0,062W
3707	4822 051 30273	27k 5% 0,062W
3709	4822 051 30471	470R 5% 0,062W
3711	4822 051 30273	27k 5% 0,062W
3712	4822 051 30472	4k7 5% 0,062W
3713	4822 052 10109	10R 5% 0,33W
3714	4822 051 30472	4k7 5% 0,062W
3715	4822 051 30103	10k 5% 0,062W
4201	4822 051 30008	0R Jumper 0603
4202	4822 051 30008	0R Jumper 0603
4203	4822 051 30008	0R Jumper 0603
4204	4822 051 30008	0R Jumper 0603
4205	4822 051 30008	0R Jumper 0603
4206	4822 051 30008	0R Jumper 0603
4207	4822 051 30008	0R Jumper 0603
4208	4822 051 30008	0R Jumper 0603
4209	4822 051 30008	0R Jumper 0603
4210	4822 051 30008	0R Jumper 0603
4211	4822 051 30008	0R Jumper 0603
4212	4822 051 30008	0R Jumper 0603
4214	4822 051 30008	0R Jumper 0603
4215	4822 051 30008	0R Jumper 0603
4216	4822 051 30008	0R Jumper 0603
4217	4822 051 30008	0R Jumper 0603
4219	4822 051 30008	0R Jumper 0603
4220	4822 051 30008	0R Jumper 0603
4221	4822 051 30008	0R Jumper 0603
4222	4822 051 30008	0R Jumper 0603
4223	4822 051 30008	0R Jumper 0603
4224	4822 051 30008	0R Jumper 0603
4225	4822 051 30008	0R Jumper 0603
4226	4822 051 30008	0R Jumper 0603
4227	4822 051 30008	0R Jumper 0603
4228	4822 051 30008	0R Jumper 0603
4229	4822 051 30008	0R Jumper 0603
4230	4822 051 30008	0R Jumper 0603
4231	4822 051 30008	0R Jumper 0603
4232	4822 051 30008	0R Jumper 0603
4233	4822 051 30008	0R Jumper 0603
4234	4822 051 30008	0R Jumper 0603
4235	4822 051 30008	0R Jumper 0603
4503	4822 051 30008	0R Jumper 0603
4504	4822 051 30008	0R Jumper 0603

**COILS & FILTERS**

5005	2422 549 44608	INDFXD 0603 EMI 100MHz 1k
5006	2422 549 44608	INDFXD 0603 EMI 100MHz 1k
5262	2238 586 59812	100nF +80/-20% 50V
5300	2422 536 00614	Coil 18,5T 0.5-2UEW 5,6D B

5301	2422 536 00614	Coil 18,5T 0.5-2UEW 5,6D B
5302	2422 536 00614	Coil 18,5T 0.5-2UEW 5,6D B
5303	2422 536 00614	Coil 18,5T 0.5-2UEW 5,6D B
5700	4822 157 62552	Coil 2,2uH 5%

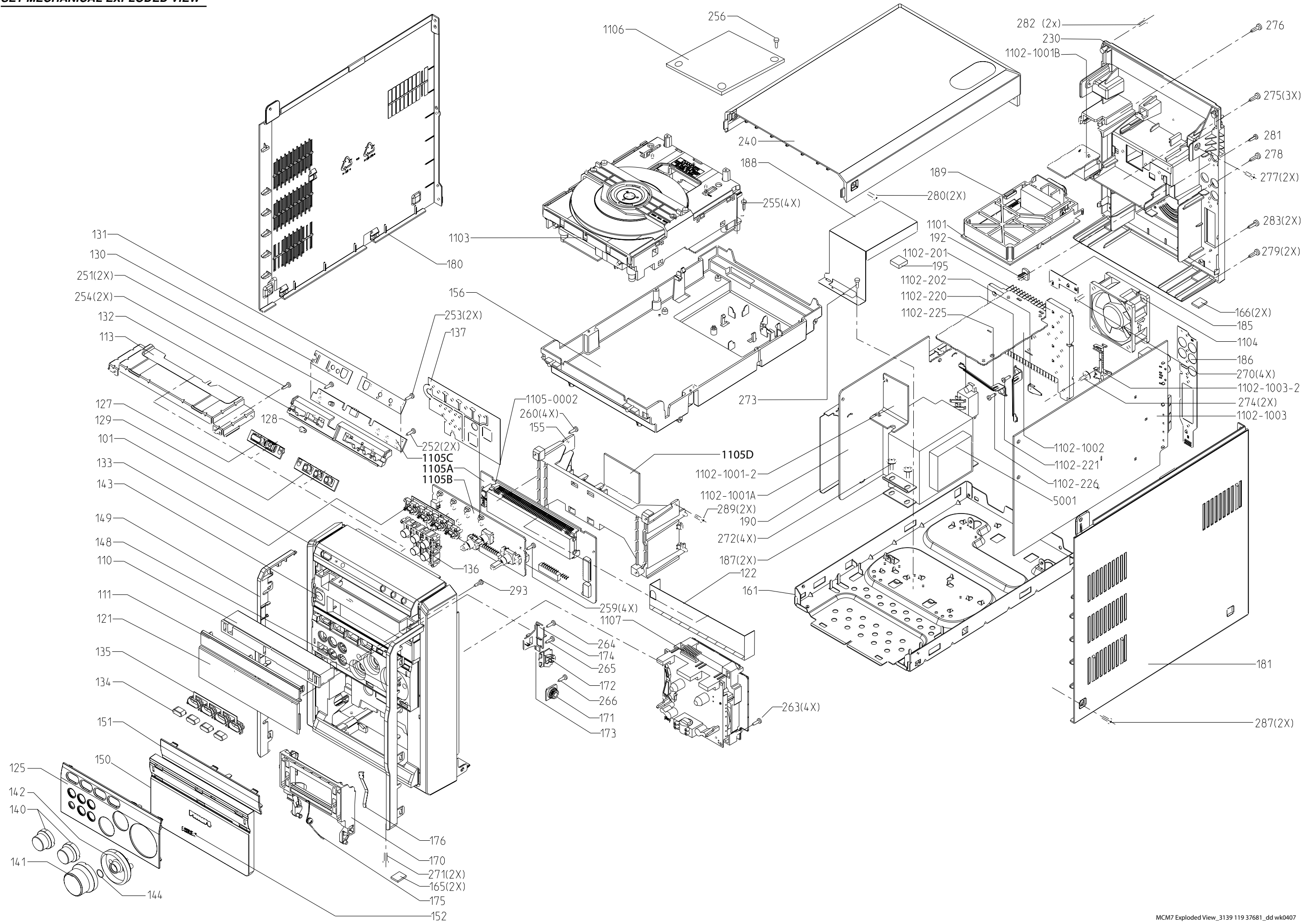
**DIODES**

6002	4822 130 30621	1N4148
6005	4822 130 61219	BZX79-C10
6301	4822 130 31878	1N4003G
6302	4822 130 31878	1N4003G
6303	4822 130 31878	1N4003G
6304	9322 163 82682	DIO REC BYV98-200
6306	4822 130 30621	1N4148
6307	3198 010 53980	DIO REG BZX79-B3V9
6308	5322 130 31938	BYV27-200
6315	4822 130 34398	BZX79-B24
6323	4822 130 30621	1N4148
6324	4822 130 34278	BZX79-C6V8
6325	4822 130 31878	1N4003G
6326	4822 130 30621	1N4148
6327	4822 130 30621	1N4148
6330	4822 130 30621	1N4148
6331	4822 130 30621	1N4148
6332	4822 130 30621	1N4148

**TRANSISTORS & INTEGRATED CIRCUITS**

7000	4822 130 60373	BC857B
7004	4822 130 42804	BC817-25
7005	4822 209 17345	IC SM M62320FP
7006	5322 130 60845	BC807-25
7009	4822 130 42804	BC817-25
7010	5322 130 60159	BC847B
7013	4822 130 60373	BC857B
7300	5322 130 60159	BC847B
7301	9322 153 02682	IC AN7591
7302	9322 153 02682	IC AN7591
7304	4822 130 11578	FET POW STP16NE06
7307	4822 130 60373	BC857B
7308	5322 130 60159	BC847B
7309	4822 130 11336	FET POW STP16NE06FP
7310	4822 130 60373	BC856B
7313	4822 130 60373	BC857B
7325	5322 130 60159	BC847B
7328	4822 130 42804	BC817-25
7329	4822 130 42804	BC817-25
7505	5322 130 60159	BC847B
7506	9322 150 74668	IC SM TDA7468D
7700	4822 209 31378	IC SM NJM4556AM

Note : Only the parts mentioned in this list are normal service spare parts.

**SET MECHANICAL EXPLODED VIEW**

**MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT****SCREW LISTS - MAIN UNIT**

0101	3139 254 00181	Cabinet Front	/22	0192	3139 114 71010	Stopper Heatsink	251	D2 x 8
0101	3139 254 00351	Cabinet Front V2	/37	0230	3139 254 00211	Panel Rear	252	D2 x 8
0110	3139 254 00441	Cover CD Technical UL Loader		0230	3139 254 00201	Panel Rear V2	253	D2 x 8
0111	3139 254 00141	Cover CD		0240	3139 254 00581	Cover Top	254	D2 x 8
0121	3139 254 00171	Window Display	/22	0240	3139 254 00321	Cover Top V2	255	D3 x 20
0121	3139 254 00681	Window Display	/37	0325	3139 119 02401	L/R Loudspeaker Box	256	D3 x 8
0125	3139 254 00131	Panel Control		0331	2422 076 00546	Cable FM Aerial	259	M3 x 12
0127	3139 254 00091	Button Set Power Chrome		0331	4822 320 11094	FM Antenna Wire	260	D3 x 10
0128	3139 114 79981	Lightguide Power Standby		0332	2422 549 45067	Antenna AM Loop	263	D3 x 12
0129	3139 254 00081	Button Set RDS/News		0333	3139 238 06511	Remote Control	264	D3 x 12
0132	3139 114 79921	Bracket Button RDS		0336	2422 070 98151	△ Mains Cord	265	M3 x 12
0133	3139 254 00071	Button Set Source		0336	2422 070 98246	△ Mains Cord	266	M3 x 12
0134	3139 114 79911	Cap Source Chrome		1104	2822 031 01494	Fan 12VDC 0.8W 3100RPM	270	D3 x 35
0135	3139 114 79971	Lightguide Source		1106	3103 308 67611	PBAS 8 MP3CD03 TXT 5V	271	M3 x 6
0136	3139 254 00101	Button Set Function		5001	3103 308 30780	△ Mains Transformer	272	M3 x 10
0140	3139 254 00051	Knob Bass/Treble Chrome		5001	3103 308 30770	△ Mains Transformer	273	M3 x 6
0141	3139 254 00061	Knob Volume Chrome		8001	3139 110 35900	FFC Foil 07P/220/07P AD	274	M3 x 10
0142	3139 254 00001	Lightguide Volume		8003	3139 111 03871	FFC Foil 15P/280/15P BD Fold	275	D3 x 10
0143	3139 114 79991	Lightguide IR		8004	3103 308 93622	CWAS FFC 98 19P BD	276	D3 x 10
0144	4822 492 51374	Ring		8005	3139 110 35240	FFC Foil 08P/280/08PAD Fold	277	D3 x 10
0148	3139 254 00041	Frame Right		8006	3139 110 35080	FFC Foil 09P/180/09P AD	278	D3 x 10
0149	3139 254 00031	Frame Left		8007	3139 111 03881	FFC Foil 19P/180/19PAD Fold	279	M3 x 10
0150	3139 254 00121	Cover Cassette		8009	3139 110 34840	FFC Foil 08P/100/08P AD	280	M3 x 10
0151	3139 254 00111	Panel Cassette		8010	3140 110 20881	FFC Foil 15P/120/15P AD	281	D3 x 16
0152	4822 459 10887	Badge Philips Assy		8011	3139 110 35090	FFC Foil 04P/340/04P BD	282	D3 x 12
0155	3139 114 79941	Bracket Combi		8012	3139 110 34480	FFC Foil 07P/140/07P AD	283	D3 x 10
0156	3139 114 79901	Bracket Module Mounting		8013	4822 320 12752	FFC Foil 07P/180/07P AD	287	M3 x 10
0165	3139 113 27140	Foot Rubber 4mm					289	D3 x 10
0166	3139 113 27140	Foot Rubber 4mm					293	D2 x 8
0170	3139 114 73930	Door Cassette ETF SD Left		<b><u>Left/Right Loudspeaker Box Breakdown</u></b>				
0171	4822 529 10322	Damper Assembly		9965 000 23631	Cloth Grille Assembly			
0172	3139 114 68640	Push Catch Left		9965 000 23632	Badge Philips			
0173	4822 492 11344	Spring Compression		9965 000 23633	Grommet (Grey)			
0174	4822 402 11245	Bracket Left						
0175	3139 111 01390	Spring Torsion Left						
0176	4822 492 42787	Spring Cassette		Note : Only the parts mentioned in this list are normal service spare parts.				
0180	3139 114 76040	Panel Left	/22					
0180	3139 114 75880	Panel Left V2	/37					
0181	3139 114 76050	Panel Right	/22					
0181	3139 114 75890	Panel Right V2	/37					